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AGRICOLA USER'S GUIDE

UNITED STATES
DEPARTMENT
OF AGRICULTURE

SCIENCE AND
EDUCATION
ADMINISTRATION

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DEPARTMENT OF AGRICULTURE
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AGRICOLA USER'S GUIDE

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TEXAS A&M UNIVERSITY LIBRARY

AGRICULTURAL REVIEWS AND MANUALS. ARM-H-7

UNITED STATES
DEPARTMENT
OF AGRICULTURE

SCIENCE AND
EDUCATION
ADMINISTRATION

BELTSVILLE, MD. 20705
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PREFACE

When the National Agricultural Library contracted to have its CAIN citation database put online for literature retrieval in 1973, staff members at NAL started working with several guides and manuals for reference at the terminal and formal training workshops. In 1976 the *CAIN Online User's Guide* was published to help librarians and information specialists use this database on the two major online systems. This guide, additionally, made available statements of practices not elsewhere recorded for public use.

Over the past two and a half years the guide has been distributed widely and has been used successfully in numerous training workshops around the country. Significant changes both in the database itself and in the online systems providing access to it have necessitated the revisions contained in this new edition of the guide. Most obvious, of course, is the change in the name of the database from CAIN to AGRICOLA (Agricultural Online Access), a reflection of the changing nature of the file from the original cataloging and indexing systems of NAL to a family of agriculturally oriented databases. Today AGRICOLA contains not only the cataloging and indexing records of NAL but also substantial files on food and nutrition from the Food and Nutrition Information and Educational Resources Center and on agricultural economics from the American Agricultural Economics Documentation Center. The implementation of several major refinements to the Lockheed DIALOG program, a thoroughgoing revision of the SDC ORBIT program, and the advent of the Bibliographic Retrieval Service as a major access system for AGRICOLA have also contributed to the need for this revised guide.

Although this manual is aimed at the online user of the AGRICOLA database, it will be useful to other users of bibliographic citation files. The sections outlining the policies followed by those who create AGRICOLA records will aid the scores of scientists and research staff who utilize batch mode services such as the USDA Current Awareness Literature Service (CALS). Section II of this guide can be particularly useful as a supplement to the specialized guides available for such systems. Similarly this section can be of use to those librarians and information specialists who desire to know more about the policies followed in selecting and processing records for published indexes such as the *Bibliography of Agriculture*. Due to the introduction of changes in tape format in 1979, an expanded bibliographic record will be available. Users of this manual will be notified of these changes by means of new "drop-in" sheets.

Comments or suggestions for changes should be forwarded to:

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FOREWORD

To anyone seeking a graphic illustration of a rapidly changing information system I recommend the task of revising a guide to a database such as AGRICOLA. Not only has the database changed in name and coverage, but numerous modifications have been effected in the systems providing service on the file. Scarcely a page of the original *CAIN Online User's Guide* has escaped some sort of revision.

This revision could not have been done without the invaluable assistance of other people. Staff members at the National Agricultural Library helped by providing me with updates to processing policies and by reviewing the text for overall accuracy, while representatives of the three online vendors have been most generous in answering my many questions about their individual systems. This assistance is most appreciated; any errors which have persisted are clearly my own.

Finally, Leila Moran, Chief of the Reference Branch at the National Agricultural Library deserves a special note of thanks for her efforts at editing the manuscript and overseeing its final production.

September, 1978

Charles L. Gilreath
College Station, Texas

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SECTION I

INTRODUCTION

A. HISTORY OF THE SYSTEM

AGRICOLA, an acronym for Agricultural On-Line Access, is the machine-readable database produced and maintained by the National Agricultural Library to support the bibliographic research of agricultural scientists. Citations to the published literature in virtually every field of agriculture will be found in the system. Representative of the specific subjects which can be searched are the following:

Agricultural engineering	Horticulture
Agricultural marketing	Land management
Animal breeding	Nutrition
Energy in agriculture	Pesticides
Entomology	Plant genetics
Environmental pollution	Remote sensing in agriculture
Farm management	Rural sociology
Fertilizers	Soil sciences
Foods and feeds	Veterinary medicine
Forestry	Water resources

The database started in January 1970 as the cataloging and Indexing system of NAL (CAIN), developed from an earlier computerized system in use at the Pesticides Information Center. Since that time the CAIN system has been used by other units of the U.S. Department of Agriculture to develop specialized bibliographic files. The AGRICOLA database receives citations from many sources, for example, Environmental Impact Statements, Brucellosis Subfile, the Food and Nutrition Information and Education Resources Center (FNIC),*and the American Agricultural Economics Documentation Center (AGECON). The name AGRICOLA was adopted in July 1976 to reflect more accurately the broadening scope of the database.

Bibliographic records prepared by the staff at NAL and the two other information centers are processed by the Computer Applications section of NAL and recorded on magnetic tape. These machine-readable records are then the bases for several publications and other information services. Internally, NAL uses the tapes to produce its own catalog cards and the editions of the *FNIC Catalog*. Copies of the tapes are also produced for users outside the National Agricultural Library. The *Bibliography of Agriculture* and the *National Agricultural Library Catalog*, for instance, are published by two commercial firms from monthly sale tapes. Several other organizations acquire copies of the monthly tapes for direct searching by computer either in a batch mode or in an online, interactive mode. With such systems there are numerous information services that are possible, ranging from selective dissemination of information services (SDI) and retrospective literature searching on demand to retrieval of catalog copy and citation verification for interlibrary loan.

This manual will concentrate on the online mode of accessing the basic strategies employed in constructing search strategies for online literature retrieval and the fundamentals of establishing computer communications. Section II provides the user with information about the AGRICOLA unit record plus an explanation of the policies and practices followed by each of the units preparing records for the data base. Sections III through V provide detailed information about access to the AGRICOLA database. Section III describes how to access AGRICOLA with the DIALOG system of

* The name of the Center was changed October 1979 from Food and Nutrition Information and Educational Materials Center (FNIC).

Lockheed Information Retrieval Service, Section IV describes access to AGRICOLA through the ORBIT system of System Development Corporation, and Section V covers access using the system of Bibliographic Retrieval Services. These last three sections are fairly detailed and are designed for the user who is in need of a fairly comprehensive treatment on how to search AGRICOLA utilizing a particular online system. For at-the-terminal reference several charts summarizing information in Sections III through V have been placed in appendices at the end of the manual.

B. FUNDAMENTALS OF ONLINE RETRIEVAL

This section outlines the principles of using online computer programs to retrieve citations from a bibliographic database. A discussion of computer retrieval operation is followed by discussions of Boolean logic and search strategy formulation.

COMPUTER RETRIEVAL OPERATION

Traditional bibliographic retrieval tools - in the form of printed indexing and abstracting services - are usually hierarchical in nature. For example, a paper which describes a mathematical model for predicting fresh tomato prices might be indexed first under a fairly broad heading such as "commodity prices." That subject heading may then be further subdivided by subheadings such as "vegetables" and "mathematical models." In order to retrieve a citation from such a bibliographic tool, the user must be able both to determine the proper form of accepted indexing terms and to understand the nature of the indexing hierarchy.

A different type of bibliographic tool from the hierarchical index is the coordinate index. In such an index the user does not work within the structure of a predetermined hierarchy of terms, but rather he* makes the connections between desired intellectual categories himself by looking among a relatively large group of keywords for those citations which contain two or more of the desired terms. It is on the principle of this type index that computer retrieval of bibliographic citations is based in many of the most heavily used systems.

Before going further, let us look a bit more carefully at an example of how a manual coordinate index works. Each item to be indexed is given a unique identifying number which is posted to a series of index cards, one for each significant term associated with that item. Commonly, uniterms - single words drawn from titles, abstracts, etc. - are the terms used in such an index, although the indexer need not be restricted to such terms.

To illustrate, assume the item to be indexed is an article by John Jones entitled "Insect Pests of Tomatoes." First, the item would be given an identification number - 153, let us say. That number would be added to appropriate columns of index cards according to the *last* digit in the identification number as shown in figure 1. Posting in columns in this manner is simply to aid the eye in scanning numbers.

*Although personal pronoun references in this manual are consistently masculine, the intent is that they be interpreted generically since gender has no relation to competence or effectiveness of the search analyst.

INSECT									
0	1	2	3	4	5	6	7	8	9
110			53			16		8	49
			153			276			

PESTS									
0	1	2	3	4	5	6	7	8	9
110	81		13		5	276	37	308	
120			153		25				

TOMATO(ES)									
0	1	2	3	4	5	6	7	8	9
	11		153			26	17		99

#153

Insect Pests of Tomatoes

J. Jones. Am. J. Entom.

5(3), 10-12, Mar. 7, 1970.

FIGURE 1

To retrieve information from such an index, the user simply pulls appropriate index term cards and then looks for the occurrence of the same item numbers in different cards. For example, a user interested in finding information on drought-resistant strains of wheat might pull the three cards shown in figure 2.

DROUGHT									
0	1	2	3	4	5	6	7	8	9
10		12			25	6	37		
40					35	26			

RESISTANT (NCE)									
0	1	2	3	4	5	6	7	8	9
40	1	32		24	25	26		18	
	31			44	35	36		48	

WHEAT									
0	1	2	3	4	5	6	7	8	9
40						5	26		
					25				

FIGURE 2

From these cards the user would see that items 25, 26, and 40 contain all three of the desired terms and are therefore likely to be on the topic. In order to find these references, the user must finally go to another file containing the full bibliographic citations arranged by their identification numbers. The items cited in our example might have led the user to articles entitled "Drought Resistant Wheat in Western Kansas," "Drought- and Insect-resistance in grain crops (Wheat, Barley)," and "Insect Resistance of Untreated Wheat Stands under Drought Conditions."

A manual system such as this one works reasonably well provided the database is not too large or the number of terms to be searched is fairly small. But an index covering over 100,000

articles, or search strategies requiring that 15 or 20 terms be coordinated is too unwieldy for manual operation. The computer, however, is ideally suited to the task of comparing numbers required in such an indexing system.

The searching system for an online computer system is, in fact, merely a much more sophisticated version of the manual system described above. A typical online search file structure looks like the one illustrated in figure 3.

The Index File is an alphabetic list of searchable terms with the number of postings for each term and a pointer to the first item in the Searching File for that term. The Searching File is very similar to the card file of the manual system; it contains sequential lists of numbers for each term in the Index File. It is the numbers in this file that are compared when the computer looks for coordinations of terms. Finally, the Unit Record file contains the actual bibliographic citations in machine readable form. This file normally comes into use when the terminal operator requests to see the results of his searching.

Let us take again the example of a user looking for articles on drought-resistant wheat to illustrate the operation of the online system. The terminal operator instructs the program to find all coordinations of the three terms DROUGHT, RESISTANT, and WHEAT. First, the computer goes to the Index File and finds the following information:

<u>POSTINGS</u>	<u>TERM</u>	<u>1st #</u>
8	DROUGHT	40
7	RESISTANT	48
5	RESISTANCE	44
4	WHEAT	40

It then goes to the Searching File, takes the appropriate item numbers from the file and compares them, as shown below:

<u>DROUGHT</u>	<u>RESISTANT</u>	<u>RESISTANCE</u>	<u>WHEAT</u>	<u>COORDINATIONS</u>
40	48	44	40	40
37	40	32	26	26
35	36	26	25	25
26	35	25	5	
25	24	18		
12	13			
10	1			
6				

Having found three items, the computer reports this fact to the operator. If the operator then wishes to view these three items, the computer goes to its Unit Record File, finds items 40, 26, and 25, and displays them at the terminal.

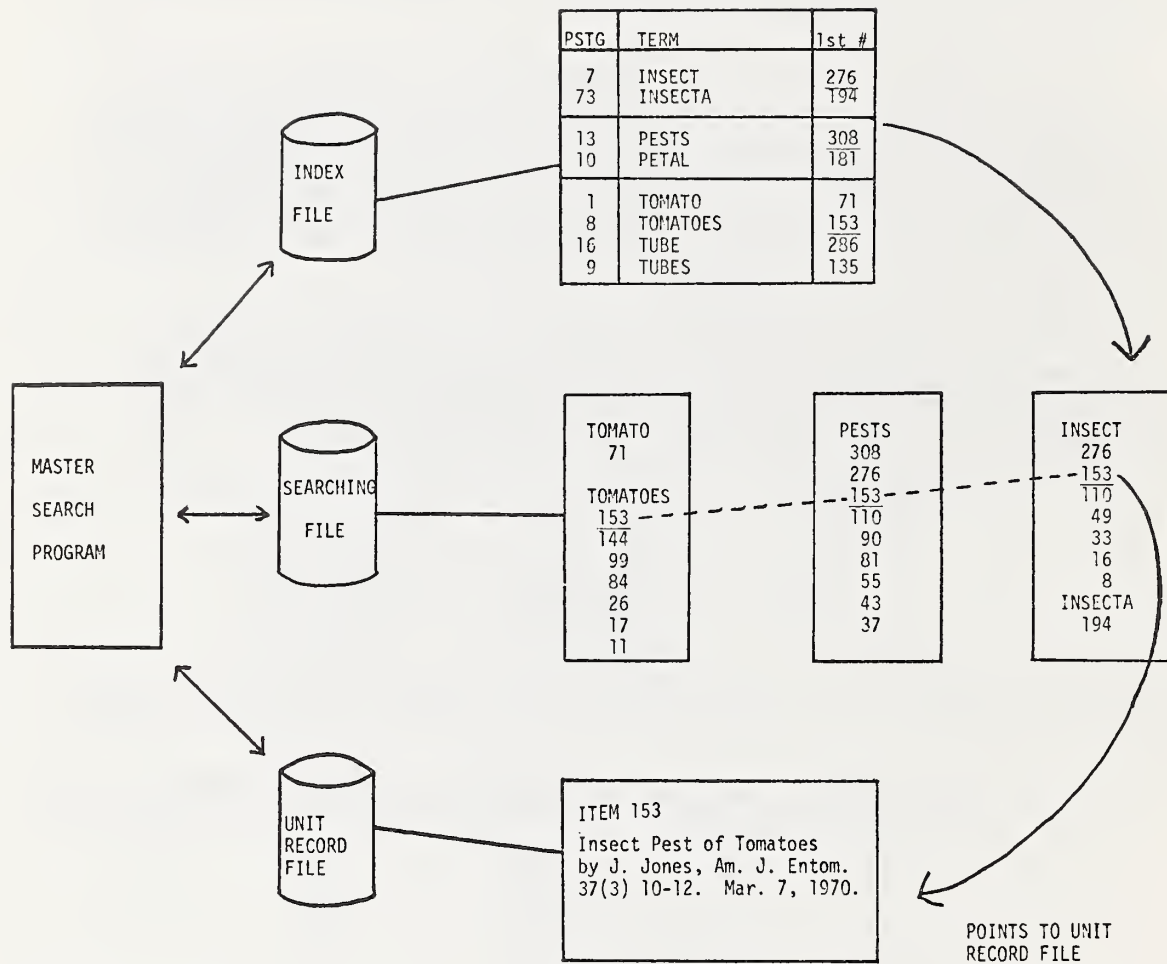


FIGURE 3

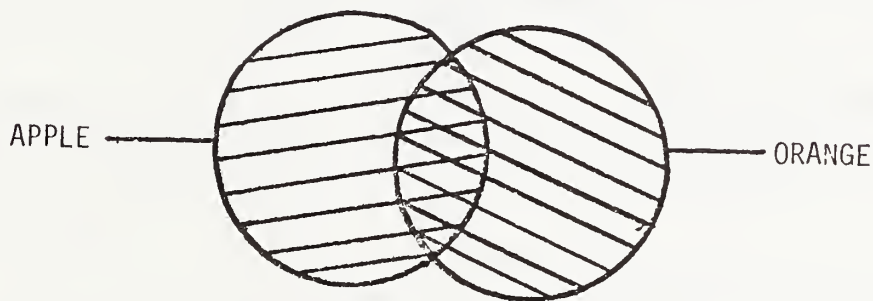
BOOLEAN LOGIC

Having seen very generally what the computer does in response to commands from the user, we now turn our attention to the means by which the searcher instructs the computer to combine terms. This task is accomplished through the use of Boolean logic, named for its developer George Boole.

Individual search terms can be combined through use of the Boolean logical operators OR, AND, and NOT (sometimes called AND NOT). Use of these operators allows the searcher either to increase the recall of his final output by broadening search parameters or to increase the precision of his output by (1) cutting out unwanted elements or (2) requiring that additional search parameters be satisfied. The function of each Boolean operator will be discussed in the paragraphs that follow.

Logical OR. The Boolean operator OR serves primarily an additive or broadening function. Its use allows the searcher to combine several terms into a single set or search statement.

The Venn diagram graphically illustrates the function of OR with the terms APPLE and ORANGE.



APPLE OR ORANGE

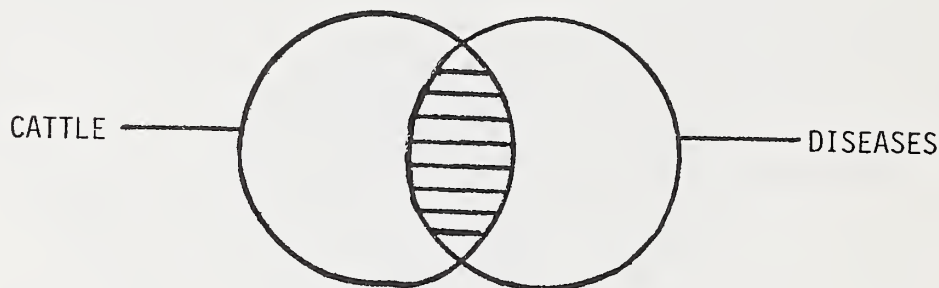
In normal English discourse a person who uses the conjunction "or" implies an exclusive arrangement; that is, when a person says, "Give me an apple or an orange," he expects one or the other but not both. Such is not the case with Boolean logic - or the computers which use it.

When he uses the logical OR, the searcher is, in effect, telling the computer to create a set consisting of all items in the database containing either the term APPLE or the term ORANGE or both of them together.

Notice in the diagram that there is a small area where the circles overlap. This area represents those items which contain both of the search terms. Potentially the user could retrieve the same item twice, using OR logic - once for each time one of his search terms appears. The computer, however, adjusts for this contingency and counts OR-ed terms in such a way that duplicate retrieval is eliminated. For example, assume the computer found 50 citations containing the term APPLE and 35 citations containing the term ORANGE. Also assume that there are 10 citations in the database which contain both terms; when the individual sets were combined with OR, the result would then be a set containing 75 citations: 40 containing only APPLE, 25 containing only ORANGE, and 20 containing both terms.

Logical AND. The Boolean AND serves as a tool for narrowing the output of a search. The searcher uses this operator to look for co-occurrences of various search terms.

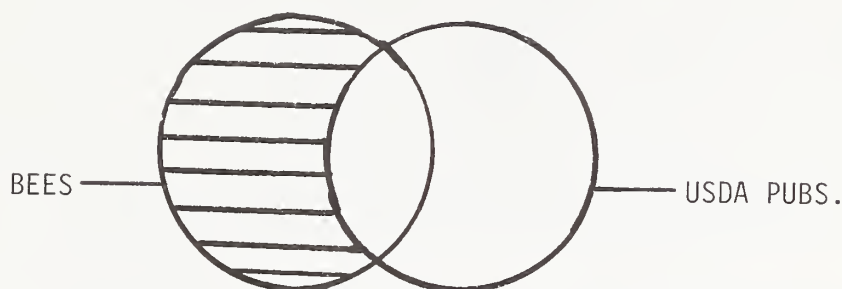
The Venn diagram for the search statement CATTLE AND DISEASES is illustrated below:



CATTLE AND DISEASES

The only items retrieved in such a search are the ones containing both of the desired terms. No word order is specified when the Boolean AND is used; so both an item entitled "Annual Review of Cattle Diseases" and one entitled "Diseases Common to Horses and Cattle" would be retrieved in this example.

Logical NOT (AND NOT). The NOT operator is used to exclude from a set some unwanted element. For instance, a user who desired information on bees but was not interested in USDA publications might wish to use NOT logic as illustrated in the diagram.



BEES NOT USDA PUBS.

The resulting set is a list of items containing the term BEES, excluding only those items published by the U.S. Department of Agriculture.

This method is a safe and proper use of the NOT operator. It may also be usefully employed to exclude other categories of information, such as the work of authors already familiar to the patron or articles in a specific journal. Thus, one might ask for all references containing the word "alpaca" except for any works by J.L. Montemayor.

The NOT operator can be quite useful as well in isolating particular groups of references during an online computer search session. In the course of broadening his search, for example, the user may utilize this operator to eliminate from the newly broadened output, those references which have already been retrieved, thereby allowing him to view only the net increase of his broadened search.

Great caution, however, must be exercised in the use of NOT in order to avoid eliminating inadvertently any desired citations. Problems of this type arise primarily in trying to use NOT to eliminate unwanted subject terms. For example, in a search on varieties of corn, the user may want to eliminate hybrid varieties, but there is no way to do this without also eliminating all items on ordinary varieties which may mention hybrid varieties in the same citation. Specifically, a title such as "Free Amino Acids in the Leaves of Inbred and Hybrid Varieties of Corn" would be eliminated by use of NOT in this way.

The illustrations up to this point have been quite simple, utilizing only two term combinations with single Boolean operators. By using a mixture of logical connectors in conjunction with several search terms a powerful research tool can be developed. The following example will, perhaps, illustrate how the Boolean operators can work together to retrieve useful information.

Let us assume that a searcher is looking for articles on the commodity futures market for wheat and corn. First, he selects separately the terms WHEAT and CORN and then combines them with the logical operator OR. Up to this point his computer printout might look like this:

<u>SET #</u>	<u>CONTENT</u>	<u># ITEMS</u>
1	WHEAT	11812
2	CORN	7142
3	1 OR 2	18727

Note that the 18727 items in set 3 are 227 fewer than the arithmetic sum of the items in sets 1 and 2. This indicates that there are 227 items which contain both the terms WHEAT and CORN, and the computer has counted these items only once in a combined set.

The user then selects the search terms FUTURES and, using the AND operator, combines it with the composite set number 3, thus:

4	FUTURES	143
5	3 AND 4	8

Finally, he chooses to exclude all monographic publications from his output by using the NOT operator. The search strategy would end up looking like this:

6	MONOGRAPHS	72931
7	5 NOT 6	7

To summarize, the user has had the computer look for all items in which the term FUTURES co-occurs with either CORN or WHEAT, and he has excluded any monographic publications from his output.

SEARCH STRATEGY FORMULATION

Finally, we are ready to put things together into a general principle of search strategy formulation. The assumption underlying all computer retrieval of this type is that if a bibliographic citation contains a desired combination of specified keywords, then that citation may be relevant to the search topic. Of course, this assumption does not always hold true, as is illustrated by the retrieval of an article entitled, "Italian Economic Boat Leaking" during a search in the economics of the boating industry. It does, however, hold true often enough to make computer retrieval a valuable research tool.

While "false positives" such as "Italian Economic Boat Leaking" cannot be avoided totally, their number can be minimized through careful planning of the search strategy. If the essence of search strategy formulation can be summarized in one sentence, it is this: Efficient retrieval from a computerized bibliographic database requires 1) a clear idea of the topic to be searched, clearly stated; 2) the development of an adequate list of keywords divided logically into concept groups; 3) an ability to adjust the initial strategy on the basis of information gained from preliminary review of search output.

STATEMENT OF THE SEARCH TOPIC

The end user of the computer-produced bibliography is the best source of the initial statement of the search topic. It is his needs that are to be met by the computer search, and it is against his conception of the topic the results will be judged. If - as is commonly the case - the person doing the computer search is someone other than the end user, the statement of the topic may need to be negotiated. For instance an undergraduate student may say that he wants all citations on tissue culture, not realizing that the computer is likely to find over 2,000 hits - many of them in foreign languages. A trained search analyst can, however, help the patron refine his initial request, revising it according to the patron's needs and the capabilities of the system.

A well-negotiated statement of search topic should tell the searcher the following information:

1. The specific subject to be searched.
2. Priorities of various elements in the search topic, e.g., the user is specifically looking for desiccation as a technique in harvesting sunflower seeds, but anything on harvesting of sunflower seeds is also of interest.
3. Purpose for the search, i.e., is the search for an undergraduate's term paper or for a doctoral candidate's dissertation?
4. Any special requirements such as format of printed citations or date limitations, etc.

KEYWORD LIST AND CONCEPT GROUPING

Once the searcher has a clear idea of the search topic, he must devise a list of appropriate keywords for the computer to search. Keywords can be single-word terms from titles and other subject-related fields, authors' names, corporate names, subject codes, and numerous other elements from the unit record categories. Depending on the database, keywords may also be multiword terms drawn from controlled vocabulary lists.

A well-expressed topic statement can serve as a guide to selecting appropriate keywords for the search strategy. The patron requesting the search is another valuable resource for additional terms, synonyms, and alternate forms of search words. Since the CAIN database relies so heavily upon free text - uncontrolled vocabulary - searching, the analyst will be wise to consider including several alternate forms of key terms in order to allow for the many different ways in which ideas can be stated in the titles of works. For instance, the analyst who simply uses the keywords BEEF and CATTLE in his strategy, will fail to retrieve many relevant citations containing words such as COW, COWS, CALFS, CALVES, BULL, and so forth. Asking the patron for the titles of some particularly relevant items with which he is familiar and/or looking through few issues of printed indexes in the subject areas would be valuable sources of the terms likely to be used in the field. Controlled vocabulary list, such as the *Agricultural/Biological Vocabulary* or *LC Subject Headings* can also be most useful.

There is, of course, a point of diminishing returns in compiling such a list, especially in cases where the patron has imposed other constraints on the search, such as size of output or amount to be spent on the search. Complete coverage of a topic may, however, require a fairly long list of terms.

An unstructured list of possible search terms is, however, only half the search analyst's job. The other half of search strategy formulation is concept grouping. This aspect of search strategy has been alluded to earlier when Boolean operators were being discussed, but a few points need to be looked at in more detail. The computer is merely searching for strings of letters; it has no ability to judge either the context in which terms appear or the interrelationship which may exist among various groups of terms. The search analyst must therefore try to compensate for the computer's weakness by specifying which combinations of search parameters are acceptable. The most efficient method of accomplishing this task is to divide the list of key terms within a concept group with the logical OR, and then combining concept groups with either the AND or the NOT operators in order to narrow retrieval to the desired group of references.

Let us take a fairly simple example to illustrate concept grouping. A patron is looking for information regarding the effect seed size and weight have on the growth and yield of corn plants. A working list of keywords includes the following:

CORN	MASS
YIELD	LENGTH
GROWTH	WIDTH
SEED	PRODUCTION
SEEDS	MAYS
DIMENSION	MAIZE
DIMENSIONS	ZEA
SIZE	WEIGHT
YIELDS	GERMINATION

Individual combinations of all these various terms would consume inordinate amounts of both computer connect time and search preparation time. The same result, however, can be accomplished quickly and efficiently by grouping terms by concept, joining terms within this same concept group with the Boolean OR, and then looking for intersections of the various concept groups.

This problem should be broken into four concepts. First, there is the crop being studied - corn. The aspect of the plant which is the focus of the study - i.e., seed size and weight - will constitute a second and third concept, one for seed terms and one for terms related to size and weight. Finally, a fourth category of terms will need to be used to zero in on references dealing with yield and growth factors. Our initial list, grouped for searching, would look like this:

- I- - CORN OR ZEA OR MAYS OR MAIZE
- II- - SEED OR SEEDS
- III- -SIZE OR WEIGHT OR DIMENSION OR DIMENSIONS
OR LENGTH OR WIDTH OR MASS
- IV- -YIELD OR GROWTH OR PRODUCTION OR GERMINATION

The searcher would then instruct the computer to look for the intersections of the concept groups by combining them with the Boolean AND thus: I AND II AND III AND IV. To be retrieved, an item must then contain at least four keywords, one from each of the four major concept groups. Thus, this logic could retrieve titles such as "Seed Mass: Its Effects on Germination of Corn" and "Increased Seed Dimensions Produce Greater Yield (CORN)."

ADJUSTING INITIAL STRATEGY

Regardless of how thoroughly the analyst has prepared the initial search strategy, there will be times when the system will turn up valuable search terms that have been overlooked. Conversely, the search may also prove that terms originally thought to be good, are retrieving far too many "false positives" or bad hits, and therefore need to be excluded from the strategy. The searcher must be aware of these possibilities so that he can adjust the content of appropriate concept groups in order to increase the quality of the final bibliography.

Users of batch mode searching systems should review their initial results critically and make necessary adjustments so that succeeding iterations of the search will be better. Online system users have a decided advantage over batch system users in that they can adjust their strategies immediately and assess the quality of the additional items retrieved in a matter of seconds.

C. ONLINE COMMUNICATION

Access to AGRICOLA can be gained through regular teletype terminals, high-speed dedicated-line computer terminals, or teletype-compatible acoustically coupled terminals. While each of the major online vendors can support access to their data bases via teletype, users should be aware that using teletype terminals will very likely result in higher search costs because they are slower in outputting results (100 wpm) and because the TWX line charges are generally higher than the communications charges for using other data communications networks.

Dedicated line terminals offer the greatest speed (around 480 characters per second). But they also generally involve the greater expense. Their use is, therefore, probably limited to large volume operations.

The most common means of accessing online data bases is through acoustically coupled, teletype-compatible terminals. Such devices are supported by online vendors through regular telephone connections. These terminals operate at a variety of speeds ranging from 10 characters per second (100 wpm) up to 120 characters per second (1200 wpm). Today the most commonly used terminals function at 30 characters per second (300 wpm).

There are two main types of teletype compatible terminals: hard copy printers and cathode ray tube (CRT) terminals. Hard copy printers are simply typewriter-like terminals which print the two halves of the online dialogue on a piece of paper. Many models are portable, an advantage for users who expect to be carrying terminals around for demonstrations. Cathode ray tube terminals differ from hard copy terminals in that they display input and output on a television-like screen. Such terminals are not much more expensive than the terminals using paper and certainly have some advantages if the user anticipates having to demonstrate the retrieval system to groups. Two decided disadvantages, however, are the lack of portability and the lack of a permanent record of the search history. Hard copy printing devices can be added to CRT terminals for printing required information, but these are another substantial addition to the cost of the terminal.

The keyboards of these terminals resemble a typewriter with several additional keys. They communicate with the computer through an acoustical connecting device built into the terminal or wired to it. A terminal operator establishes communications with the computer by dialing the telephone number for the search service or for the intermediary communications network, Tymshare. As soon as he hears a shrill, steady tone, he places the telephone receiver into the acoustical coupling device and starts entering the necessary information to be logged in. As the keys on the keyboard are pressed, tones are emitted by the terminal. They are picked up by the telephone and transmitted to the host computer.

LOGGING IN

Logging in refers to the steps by which the user establishes data communications, connects his terminal to a vendor's computer, and gains access to the online program. The mechanics of this procedure depend upon two factors:

- 1) the type of terminal
- 2) the method of communication (Direct Dial or Tymshare)

The procedures outlined below will assume a teletype compatible terminal. A user with another type of terminal should refer to the operating manual for that terminal before attempting to log in.

DIRECT DIAL LOGIN

A. LOCKHEED

1. Presettings: Power switch to ON
Duplex switch to HALF
Speed switch to 30 cps
Space switch to SINGLE *
Mode switch to LINE (or ONLINE) *
QSL switch to UPPER *
Parity switch to ODD *
*These switches may or may not be present on your particular terminal.

2. Dial 415-493-7580. When steady high pitched tone is heard, plug telephone into sockets on the terminal, making sure the receiver cord matches the appropriately marked terminal socket. The ONLINE indicator should now illuminate, signaling that the connection has been made.

3. The Lockheed computer responds:

ENTER YOUR DIALOG PASSWORD

Enter your unique password followed by striking the carriage return key (RETURN, TRANSMIT, or INT depending on terminal make).

4. The computer responds:
LOGIN FILE (clock time on the West Coast) plus any system messages and the search heading. When the computer gives the cue "?", it is ready to accept the user's first command.

B. SYSTEM DEVELOPMENT CORPORATION (SDC)

1. Presettings: Same as for Lockheed except that parity should be EVEN.
2. Dial 213-828-9140. When the high pitched tone is heard, connect telephone receiver to the terminal, making sure to match the mouthpiece with the socket marked CORD. When the online indicator illuminates, the terminal is ready to be logged in.
3. Type/LOGIN XXXXXXXXXX (where the X's represent your unique password) and a carriage return.
4. The ORBIT IV program then responds:

YOU ARE ON LINE L85

HELLO FROM SDC/ORBIT IV. (Date and time on West Coast) YOU ARE CONNECTED TO THE ORBIT DATABASE. FOR A TUTORIAL, ENTER A QUESTION MARK. OTHERWISE, ENTER A COMMAND.

USER:

At this point the system is ready to accept instructions.

C. BIBLIOGRAPHIC RETRIEVAL SERVICE (BRS)

1. Presettings: Same as for Lockheed searching.
2. Dial the BRS direct access number provided by the vendor. When the high pitched tone is heard, connect the telephone receiver to the terminal, making sure to match the mouthpiece with the socket marked CORD. The online indicator illuminates signaling that the terminal connection is complete.
3. The BRS computer responds:
BRS * * ENTER TERMINAL ID
XXXXXXXXXX
Enter the appropriate BRS assigned terminal code and a carriage return.
4. The terminal then responds:
READY
Enter BRS XXXXXX (where the X's represent the six-character BRS password) and a carriage return.
5. The system then responds:
SIGN ON IS COMPLETE.
ENTER YES IF BROADCAST MSG IS DESIRED
:
Enter yes if the news message is needed, or enter simply a carriage return if you are ready to begin searching.

LOGIN VIA COMMUNICATIONS NETWORK

A. TYMESHARE

1. Presettings: The same as for direct dial login except that the duplex setting should be FULL.
2. Dial the Tymeshare node closest to your city. When the steady, high pitched tone is heard, connect receiver to the terminal matching cord with the appropriately marked terminal socket.
3. The Tymeshare computer will respond:
PLEASE TYPE TERMINAL IDENTIFIER
You enter the appropriate letter code (usually E); no carriage return is required.
4. The computer response will be:
PLEASE LOG IN:
Enter a carriage return.
5. The computer then asks for instructions as to which retrieval system is desired; it responds:
USER NAME:
For a connection to Lockheed's program, enter LRS and a carriage return.
For System Development Corporation's program, enter SDC and a carriage return.
6. The computer then demands a password by responding:
PASSWORD:
For Lockheed, type in DIALOG and a carriage return; for SDC, type in ORBIT plus a carriage return.
7. Once connected to the desired system, responses will vary;
 - a. The Lockheed response will be:
HOST IS ONLINE
PLEASE ENTER YOUR DIALOG PASSWORD: XXXXXX
 - b. The SDC response will be simply a semi-colon directly over the first letter of the last Tymeshare response.

From this point on you are connected to the searching systems just as if you had dialed in directly; so enter appropriate responses for logging into the system (beginning at step 3).

B. TELENET

1. Presettings: The same as for direct dial login except duplex setting should be FULL.
2. Dial the Telenet node closest to your city. When the steady, high pitched tone is heard, connect receiver to the terminal matching cord with the appropriately marked terminal socket. When the online indicator illuminates, enter three carriage returns in succession.
3. Telenet computer response will be:
TELENET
202 DP 1
TERMINAL=
@

Enter the coded address for the searching system desired:

For Lockheed enter C 415 20 and a carriage return.
For SDC enter C213 33 and a carriage return.
For BRS enter C 315 20BR and a carriage return.

4. The Telenet computer will then verify that the desired system is connected.
At this point proceed as if dialing in directly (beginning at step 3).

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SECTION II.

PRODUCING AGRICOLA TAPES

A. THE AGRICOLA MASTER UNIT RECORD

The AGRICOLA tapes are made up of thousands of unit records, individual bibliographic entries in a standardized format consisting of a 173-character, 49-field base record describing particular aspects of the citation, followed by up to 57 segments containing the bibliographic elements such as author, title, subject tracings, and so forth. Those who use the AGRICOLA tapes either in batch mode or through their own online system can pull from this standardized record those elements of most interest to them.

Commercial online retrieval services take the AGRICOLA tape and select certain items from these unit records for searching in their own systems. Certainly, not all vendors will choose the same elements for online searching; therefore, close study should be made of the structure of the online unit record described by each vendor. For instance, where one company may have chosen to make a particular field of the master unit record searchable, another may only print that field as part of a full citation without allowing it to be searched at all. Or where one company searches two master unit record categories as separate items, another may combine the categories for searching. See sections on the specific commercial systems for descriptions of those versions of the unit record.

The next few pages describe the AGRICOLA Master Unit Record and the kinds of information that can potentially be retrieved from it. Those planning to access the AGRICOLA tapes with their own institution's equipment may find this description particularly useful.

NATIONAL AGRICULTURAL LIBRARY CAIN SYSTEM

RECORD DESCRIPTION OF THE CAIN PERMANENT MASTER AND AGRICOLA RECORD

The magnetic tape is 9 track, 800/1600 bpi, EBCDIC code with standard IBM-360/370 header and trailer labels. Records are variable length 173 to 3878 bytes, blocked 2.*

The record contains a base or fixed length portion of 173 bytes which contain various fixed length fields as described below. Following the base record is a variable number of fixed length 65 byte segments which contain the bibliographic information.

<u>Position</u>	<u>Field Name</u>	<u>Description</u>
1-2	File Code	The codes indicate whether a record is an initial entry on the temporary file (01); or a corrected record on the temporary file (02). Usually appears as "02" (except "01" for Food and Nutrition Information Center records).

*Both cataloging and indexing records are contained in this data base. Cataloging practice follows the *Anglo-American Cataloging Rules*.

<u>Position</u>	<u>Field Name</u>	<u>Description</u>
3-4	Year	Last two digits of the year in which the record was entered.
5-11	ID Number	Unique record identification number.
12-17	Primary Category Code	6 digit primary subject category code used in NAL publications.
18-19	Reserved	Used for CAIN internal processing.
20	English Indicator	0 = Text in English 1 = Text is not in English
21	Translation	0 = No translation 1 = Translation is available
22-24	Language Code	3 character abbreviation indicating language of text if not in English.
25	Approval Code	Always "1", indicating the record has been reviewed and approved for distribution.
26-29	Proprietary Restrictor	A 4 byte code indicating restriction of proprietary information or a reference shelving location.
30-37	Search Date	Latest date recorded on the document that generated this record, formatted YYYYMMDD. This date is used by NAL software for information retrieval purposes.
38-43	Last Revision Date	Date this record was placed on the file or date of last revision to this record. (Format = YYMMDD)
44-46	Segment Count	Determines the length of the variable portion of this record. It contains a number in range 000 through 057 which is the actual number of fixed length data segments in the record. Since each data segment is 65 bytes in length, this count multiplied by 65 is equal to the number of bytes in the variable length portion of the record.

<u>Position</u>	<u>Field Name</u>	<u>Description</u>
47-50	Record Length	Total number of bytes in this record <u>not</u> including those bytes added and used by IBM software for variable length record handling.
51-59	Citation Number	Contains zeros. It is used as a temporary save field by NAL to hold newly computer assigned CAIN record numbers pending the monthly photocopy run for publication.
60-61	Reserved	Work area for internal CAIN processing.
62-67	Secondary Category Code	6 digit secondary subject category code (or zeros if a secondary code is not available) used for NAL publications.
68	AGRICOLA Action Code	In the AGRICOLA record only. N = New AGRICOLA Record C = AGRICOLA Change Record D = AGRICOLA Delete Record

NOTE: The following 17 fields are 5 bytes in length and make up a directory for the purpose of locating the fixed length segments of 65 characters each that comprise a variable length data element (Title, Author, etc.). Each directory entry is related to a specific data element and contains a number which points to the starting segment and gives actual number of segments contained in the data element. The format is XXXYY where XXX = the starting segment of data for the specific data element and YY = the number of segments used to contain the data element. The starting segment number is relative to the first segment in the record.

<u>Position</u>	<u>Field Name</u>	<u>Contents of Segment/s</u> <u>(To which this Directory Entry Points)</u>
69-73	Directory Entry 1	New Book Shelf descriptive information.
74-78	Directory Entry 2	Document titles; Edition Statement; and Holdings Statement, which refers to the beginning volume/issue of a serial held by NAL.
79-83	Directory Entry 3	Personal Author names and descriptive data.
84-88	Directory Entry 4	Corporate Authors.
89-93	Directory Entry 5	Biographical information about personal authors such as date of birth/death.

<u>Position</u>	<u>Field Name</u>	<u>Contents of Segment/s</u> <u>(To which this Directory Entry Points)</u>
94-98	Directory Entry 6	Abbreviated Journal Title for serial article records. Imprint data for monograph records; it can include both publisher and printer as described in <i>AACR</i> .
99-103	Directory Entry 7	Pagination.
104-108	Directory Entry 8	Document Publication Date, formatted for printing.
109-113	Directory Entry 9	Call number and various citation number/s depending on what type of CAIN publication is contained in this record. Segment is formatted as follows: Position 1-24 - NAL Call number Position 25-32 - Book Catalog Citation Number Position 33-40 - Bibliographic Citation Number Position 41-48 - Bibliographic Citation Number Position 49-56 - Bibliographic Citation Number
114-118	Directory Entry 10	Subject terms. The type of term used is coded as "G" for geographic and "P" for all other non-geographic terms.
119-123	Directory Entry 11	Notes.
124-128	Directory Entry 12	Information numbers relating to patents, grants, analyses, contracts, or reports.
129-133	Directory Entry 13	Series Statement ordinarily used for monographs-in-series.
134-138	Directory Entry 14	Abstract or Extract.
139-143	Directory Entry 15	Tracings.
144-148	Directory Entry 16	Document delivery instructions/AGRICOLA Record Originator.
149-153	Directory Entry 17	Non-vocabulary cross references used for personal and corporate authors in cataloging. References are made from variant forms to preferred form of entry for Fields 25 and 30.

Position	Field Name	Contents of Segment/ (To which this Directory Entry Points)
154-155	Main Entry Code	It is used for the cataloging or indexing main entry. If the main entry code is provided (insert numeric identifier of 25, 30 or 20), the record will be sorted on the given code. If, on the other hand, a code is not inserted, then "00" automatically results in a sequential progression starting with 25 (personal author), moving to 30 (corporate author), and lastly to 20 (title), to identify the NAL main entry.
156	Title Trace Code	Indicates whether or not the title is traced. 0 = Title is traced. 1 = Title is not traced.
157	Document Type Code	Type of document which this record describes. 0 = Journal Article 1 = Monograph 2 = Serial
158-160	Filing Location/Record Source Code	3 character alphabetic abbreviation to indicate the internal NAL filing location of a document such as REF = Reference; DCB = D.C. Branch Library; etc.; or a code to identify the contributing organization, if the record has been added to AGRICOLA from a source other than NAL.
161-165	Use Codes	Indicates the type of product to be prepared for this record by the CAIN system. Following are NAL's application of this code. The definition of codes will vary for records in AGRICOLA which are not originated by NAL.
161	Cataloging Use Code	0 = Record which does not require a card. 1 = Catalog card required without subject terms. 2 = Catalog card required but must have subject terms. 9 = Record not to be printed in the NAL Catalog or any NAL publication.
162	New Book Shelf Use Code	0 = Record not to be published in the NAL New Book Shelf List. 1,2,or 3 = Indicates section of NAL New Book Shelf List in which this record will appear.

<u>Position</u>	<u>Field Name</u>	<u>Description</u>
61-62	Sequence Number	The segments of a given data element are adjacent to one another in the record and arranged in sequence by "Sequence Number". In addition, for certain elements, the "Sequence Number" is used to further identify subsets of the data within an element. Those elements containing subset identification are as follows:

<u>Element</u>	<u>Subset Within Element</u>	<u>Sequence Number Range</u>
Title	Short Title	01-15
	Alternate Title	21-35
	Translated Title	41-55
	Edition Statement	61-64
	Serial Holdings Statement	65-68
Corporate Author	First Corporate	01-09
	Second Corporate Author	11-19
	Third Corporate Author	21-29
	Fourth Corporate Author	31-39
	Fifth Corporate Author	41-49
	Sixth Corporate Author	51-59
	Seventh Corporate Author	61-69
	Eighth Corporate Author	71-79
	Ninth Corporate Author	81-89
	Tenth Corporate Author	91-99
Tracings	First Tracing	01-09
	Second Tracing	11-19
	Third Tracing	21-29
Non-Vocabulary Cross Reference	First Cross Reference	01-09 and 11-19
	Second Cross Reference	21-29 and 31-39

Except for Corporate Author, Journal Title Abbreviation, Imprint and Subject Term data elements, the "Sequence Number" is unique within an element. Each hierarchical level of a corporate author carries a unique sequence number, and levels of up to nine segments in length are permitted. To accommodate this and to identify a hierarchical level as being longer than one segment, the "Sequence Number" is duplicated in additional related segments. Subject terms are likewise treated, except that only two segments are permitted for a single term. Journal Title Abbreviation and Imprint data will carry identical "Sequence Numbers" when the element exceeds a single segment. Only two segments are permitted for these elements.

<u>Position</u>	<u>Field Name</u>	<u>Description</u>
63	Type Code	<p>For subject term segments this position contains "P" or "G" which defines the term type.</p> <p>For patent, grant, analyses, contracts or report segments it contains "P", "G", "A", "C" or "R" which indicates that the data is a personal author, corporate author or microfilm number/call number cross reference.</p>
64-65	Character Count	Contains the actual number of characters in the segment. The count ends with the last non-space.

B. NAL INDEXING RECORDS

It is necessary to realize that the Indexing Section is only one part of a large library and is affected by decisions on matters unrelated to its product - the NAL indexing portion of the AGRICOLA tape. The tape also contains records from the Cataloging Section, the Food and Nutrition Information Center (FNIC), and the American Agricultural Economics Documentation Center (AAEDC). Material to be indexed must be selected, acquired, cataloged, recorded, and routed to the Indexing Section by other sections of the Library. Indexers scan the material and select items according to criteria which will be explained in the sections that follow. Approximately 6,000 serials and many monographs are regularly scanned for items to be indexed.

The Library collects exhaustively all significant publications of agricultural interest and less exhaustively publications in chemical, biological, and environmental areas. The coverage of agriculture, botany, and entomology is as complete as possible, given certain constraints of personnel and budget and the tendency of the Federal and State governments to reorganize agencies and cause communication gaps. A case illustrative of this latter problem is NAL's less than complete coverage of materials dealing with wildlife and wildlife management, an area covered in depth by many agricultural libraries. NAL's responsibility for collecting in this area shifted several years ago when the Department of Interior was given responsibility for much of this area. Since that time NAL's coverage in this area has been limited generally to the effect wildlife has on agricultural production, for example, wild animals as crop pests or as predators of domesticated animals.

Although NAL attempts to be as complete as possible in its coverage of items within its defined areas of responsibility, gaps in coverage can occur for several reasons - some through unintentional oversights and some as a result of established policies. Illustrative of the former cause is the problem of selecting serials for indexing. A serial which was not selected for routing to the Indexing Section may have occasional articles within the scope of the *Bibliography of Agriculture*, or it may have changed its coverage since the routing decision was made. Such cases should be called to the Indexing Section's attention. The other cause - gaps caused by NAL policy - is illustrated by the cases of dissertations and of microforms. The call number is required for each AGRICOLA record, so unclassified items such as dissertations will generally not appear in the data base. Microforms are not indexed; as a result many government documents, FAO publications, and research reports acquired by the Library only in microfilm will not be picked up in AGRICOLA, except as serial cataloging records. The Indexing Section's policy of not taking material over a year old may also cause gaps in the indexing records. This is especially true where serial subscriptions lapse or where claiming of missing issues is delayed.

While some types of materials will normally not show up in AGRICOLA at all, other items will regularly appear more than once on the tapes. Any material in an analyzed series which is reflected in NAL's public catalog and also published in the *Bibliography of Agriculture*, such as important USDA, Experiment Station, or Extension Service series, and other separately paged series worthy of special note, will be on the AGRICOLA tape twice, once as an indexing record and once as a series analytic from cataloging. There will also be some duplicate items from the FNIC and the AAEDC data bases.

The sections which follow will attempt, first, to explain the subject and non-subject criteria used to select items to be indexed for the *Bibliography of Agriculture* and, second, to outline the indexing and subject enrichment policies followed by NAL indexers. Thorough understanding of these policies should enable searchers to understand better the structure of the AGRICOLA files.

NON-SUBJECT SELECTION CRITERIA FOR INDEXING

I. *Omit* the following:

- A. Time
 - 1. Items whose date of publication is over 1 year old except USDA publications and important congresses and conferences.
 - 2. Statistical publications covering less than 1 year, unless the statistics are cumulated on a shorter basis *only*.
- B. Length
 - Non-scientific articles less than one-half page, but take any article on insects or plant taxonomy, regardless of length.
- C. Form
 - 1. Catalogs of shows or indexes of plants.
 - 2. Courses of study.
 - 3. Forms.
 - 4. Newspapers
 - 5. Prize papers below college level.
 - 6. Student publications.
 - 7. Restricted use publications.
 - 8. Articles signed with pseudonyms.
 - 9. Articles with date line, or reports from cities and similar items.
 - 10. Editorials, unless by USDA personnel, or of clear agricultural importance.
 - 11. Interviews, except in unusual cases.
 - 12. "Monthly hints" type of materials.
 - 13. Presidential addresses without titles unless by USDA personnel or of clear agricultural importance.
 - 14. Regularly featured columns.
 - 15. Separate translations of journal articles. (These are on the AGRICOLA tape as cataloging items.)
 - 16. Unsigned articles except when of clear agricultural importance.
 - 17. Abstracts except for those in conference proceedings which appear to be of the same quality as the complete papers, and (since 1977) for those by USDA personnel.
 - 18. Reprints, unless they are items in a USDA, State Experiment Station or State Extension Service series.
 - 19. Letters to the editor, except those in scientific journals and at least one page in length.
 - 20. Microforms.

D. Treatment

1. Personal experience articles, unless original device or method used.
2. Popular articles on amateur gardening, home processing of foods, bee-keeping, poultry or rabbit raising and similar material.
3. Reports about meetings, symposia, shows, or conferences.
4. "Success stories."

II. *Accept* the following:

- A. Articles in USDA publications and articles by USDA personnel.
- B. Awards given to scientists for agricultural research, if at least one-half page long.
- C. Biographies or obituaries of scientists connected with agriculture, if at least one-half page long.

SUBJECT SELECTION CRITERIA FOR INDEXING

In general, items are selected for indexing on the basis of their relevance to the fields of food and agriculture. The basic criteria for selection are outlined in the scope notes for the subject categories (see Section D).

Bacteria and Viruses

Articles on bacteria and viruses are selected on the basis of their relation to agricultural subjects. Items are selected in the following areas:

1. Pathogens of plants, insects, or livestock
2. Use of bacteria and viruses in biological control of insects or weeds
3. Symbiotic bacteria of plants
4. Soil microbiology
5. Rumen bacteria
6. Bacterial and viral contaminants of food or feed
7. Bacteria used in processing foods or other agricultural products
8. Bacteria as food or feed (single-cell protein)
9. Bacteria as affected by pesticides or pollution from agricultural sources

Plants

All items are selected on plants -- from Cyanophyceae (blue-green algae) up through the higher plants -- on the theory that they are all of potential agricultural interest. One exception to this rule is the exclusion of fungi pathogenic to humans.

Invertebrates

All entomological literature is taken, again on the theory that it is all of potential interest to agricultural researchers. Selection in the classes Insecta, Myriapoda, and Arachnida is exhaustive. Only the terrestrial members of the class Isopoda (sowbugs, pillbugs) are selected for indexing.

Articles on crustaceans are taken only if the organisms are treated as food or have other agricultural implications. Annelida are taken as they affect plants, livestock, or soil only. Mollusca are taken only if the organism is treated as a food or has other agricultural implications (e.g., snails and slugs).

Insect parasites or pests of man are taken, but all other animal parasites or pathogens are taken only when they affect agricultural subjects.

Vertebrates

All items are taken on livestock and other animals raised on farms (e.g., fur bearing animal raised in pens). Articles on laboratory animals of interest to veterinarians, agricultural research institute, or specialists in human nutrition are taken. Articles relating to human pathology and physiology are excluded unless they relate to diseases of livestock or to diseases caused by contaminated food, malnutrition, nutritional deficiencies, nonfood agricultural products through the primary processing states, pesticides or pollution from agricultural sources. Articles on vertebrate agricultural pests are assigned to subject categories according to the aspect covered. e.g., plant pests, 4520; stored grain pests, 2035; etc.

Fish and wildlife are taken in relation to their use as food, feed, or fertilizer, to their being raised on a farm (e.g., aquaculture), or to their being affected by pesticides or pollution from agricultural sources. Wildlife as it affects farm or forest operations is taken.

Weather

Articles on climate are taken if they treat the climate as it affects agriculture: e.g., agriculture in general in subject category 0505, physiology of field crops in 4035, culture of field crops in 4050, animal production in 2505, construction of animal housing in 5505, etc.

Agricultural Economics and Sociology

All articles on agricultural economics, rural development, rural sociology, and rural health are taken, but many appear in journals which are not subscribed to by the Library because their content of articles on agriculture is so low. The economics of synthetic products is taken when the products are in competition with agricultural products.

Agricultural Products

Items are selected on agricultural products, taken only through the primary processing stages. Articles on manufacturing processes after primary off-farm processing are taken only when they are affected by properties of the raw materials or as they relate to consumer protection (standardization, inspection, quality control, contamination, etc.).

Treatment of specific products is discussed below.

1. Textiles from natural fibers are taken through the spinning process; this includes rot-proofing, waterproofing, fireproofing, etc. Further processing states are taken only when emphasis is on the properties of the fiber.

2. Pulp and paper are taken through the pulping process but not the actual paper sheet production process, except where this process is affected by the properties of the wood or other natural fibers.
3. Tobacco is taken as a raw product or derivative but not cigar or cigarette manufacture, unless the emphasis is on the raw material.
4. Natural rubber is taken through initial processing of the latex. Articles on further processing or on synthetic rubber are taken only as they relate to the properties of the natural rubber.
5. Extracts from insects and plants are taken, but not from domestic animals (unless related to agricultural subjects in other categories).
6. Furniture and building materials for other than farm structures are taken only in relation to their agricultural or forest product content.
7. Food products are taken through all stages of processing, but not in relation to the machinery, management and labor, or economics of their manufacture unless that aspect is concerned with the properties of the raw materials.

For example, one article on starch content of potatoes as it is a factor in damage resulting from mechanical harvesters would be accepted because it deals with a property of the crop itself. Another article discussing a new potato canning machine, however, would not be within scope unless the new machine somehow affected the quality of the potatoes themselves.

TITLE ENRICHMENT

Unlike the Cataloging Section, FNIC, and AAEDC, the Indexing Section at NAL assigns no terms from a controlled vocabulary with the exception of geographic descriptors. Subject retrievability of indexing records is, however, improved through the practice of title enrichment, that is, through the addition of explanatory terms to the titles of articles. Over one-third of the items input by the Indexing Section are enriched according to the following criteria:

1. Ambiguous titles should be clarified.
2. Each title should contain the scientific name for insects, agriculturally important nematodes and pathogenic organisms, and the following plants: grass, shade trees, forest trees, nut trees, ornamental plants, drug plants (except castorbeans), spice plants, essential oil plants, rubber plants, weeds, poisonous plants, miscellaneous economic plants, and plants of unknown use.
3. Each title should contain the common name of domestic animals, diseases (when English language form is available), and the following plants: cereals, fiber, forage (except grasses), edible oil crops, sugar, tobacco, fruits, vegetables, coffee, tea, and cocoa.

4. Chemical terms in titles should be enriched by an approved common name, if readily available or if provided in the article.
5. A title should be enriched if an important subject term is abbreviated (except for abbreviations listed in *Agricultural Terms*, 1978, Oryx Press). If the common name of an abbreviated chemical name cannot be found, the full chemical name is used.
6. The title of a biographical article lacking the name of the profession to which the person belongs should be enriched with the profession (and the country when needed).
7. Articles on nematode plant diseases not containing the word "nematode" or "nematodes" should be enriched by one of those terms (begun 1974).
8. Articles on lower plants (below the Spermatophyta) are enriched with the division or more general name, if not already in the title: e.g., Cyanophyta, Pteridophyta, algae, lichens, etc. (begun 1975).
9. Articles including new taxa of insects or plants are enriched with "new taxa" if the title does not include the word "new" (begun 1975).
10. Articles on plant varieties or cultivars not including those words are enriched.
11. Articles on diseases are enriched with names of the host and parasite or pathogen, if they are not mentioned in the title.
12. Geographic enrichment is used when it is needed to clarify the title meaning unless the journal title or language code indicates the area concerned. Terms for enrichment can be more specific than those from the list of geographic descriptors (subject terms), but the appropriate geographic descriptor must be added to the subject term field: e.g., Appalachia add United States. Warsaw add Poland, etc. See the list of geographics at the end of Section II for the approved forms of terms.

In enriching titles NAL indexers follow the "Rule of Three"; that is, enrichment terms for organisms, crops, chemicals, or other subject areas up to the number of three will be added. If the subjects in an article exceed that number, a general term is used for enrichment provided that it is not already part of the title. For example, an article on corn, wheat, millet, and oats may be enriched with the term "cereals."

It should be kept in mind that the general purpose of the title enrichment practice is to improve the retrievability of titles which alone may be unclear. Enrichment terms will not consistently be added, however, to those titles that contain a word implying the broader category to which that term belongs. To illustrate, a title containing a term such as "ewes" or "lambs" will not necessarily be enriched with "sheep." The searcher interested in a comprehensive retrieval on this animal should as a matter of standard practice search on all forms of terms which could refer to sheep. This rule holds true for all other animals and plants as well.

All enrichment terms are entered as part of the title field. They may be searched just as any other terms in that field.

OTHER INDEXING PRACTICES

Category Codes

Each record prepared by the Indexing Section is assigned either one or two subject category codes. These codes, in use since 1972, correspond to the major divisions of the printed *Bibliography of Agriculture*. Prior to 1972 a more general list of subject codes was used. Both lists of subject codes are explained in more detail later in this section. The policies which govern the assignment of category codes are described in the paragraphs which follow.

The main subject or purpose of an article determines the assignment to a subject category. A general category is not used when a more specific category is available. In assigning categories the following subjects take precedence: 1. insect vectors, 2. diseases, 3. pesticides.

Double categories can be used on two different subjects, but since items assigned double codes will then be printed twice in the *Bibliography of Agriculture*, for reasons of economy the practice is limited. Most articles on pesticide residues in food will be indexed in 4560 and 1505, and articles on insects transmitting virus diseases to plants will be indexed in 4515 plus the appropriate insect category (4530 through 4545). Double indexing in other cases will depend on the length and scientific interest of the article.

If more than two kinds of crops or types of diseases are the subject of an article, the article is placed in a general subject category: e.g., plant physiology in 4030, plant diseases in 4520, animal diseases in 3005, insect pests and control in 4530. If two kinds are mentioned, the article may be double indexed if it is substantive, otherwise it too will be placed in a general subject category.

If many aspects of a crop are mentioned (physiology, culture, disease, and insect pests) the subject category for culture is chosen: field crops in 4050, horticultural crops in 4055, miscellaneous crops in 4060, and forest trees in 3515. Crops are assigned to subject categories according to use: e.g., growing turnips as a vegetable is in 4055, turnips as forage are in 4050; oaks as shade trees go in 4055, while oaks as forest trees go in 3515, etc. See Section II-D for a complete list of subject categories.

Geographics

Geographical subject headings have been added since 1973. The list used at that time was compatible with the geographics used in cataloging records, but the list was not complete and was based on political boundaries only. Beginning in 1975, the list was expanded to include some areas larger than the political unit, and the list is expanded further when necessary. See Section II-E for a complete list of geographics.

Translations

The Indexing Section takes articles translated into English, mainly from journals that are cover-to-cover translations, and adds the citation to the original article in the note field, if it is readily available. The only other translations indexed are those which accompany the original foreign language article (frequently Canadian or South African publications). There are presently over 10,000 such articles in the data base which have been processed by the Indexing Section. The other translations on the AGRICOLA tape are cataloging items.

Notes

Two standard notes are added to indexing records. "Eng. Sum." is added for all foreign language items containing a summary in English. Items containing as many as 10 bibliographic references will also bear the note "Ref." Both of these notes are entered in the Source field following the pertinent information about the publication source.

The Notes field is used by the NAL Indexing Section to enter statements regarding full text translations into English or some other language which accompany the piece being indexed.

Reviews and Bibliographies

Review articles and articles with substantial bibliographies (three or more average-size pages of references) are tagged. Bibliographies have been noted since 1974 and reviews since 1975.

Corporate Authors

Authority files for corporate authors are maintained and used for both indexing and cataloging records. The AGRICOLA data base is, however, created by simply adding the contents of monthly sale tapes to the already existing files; extant records are not regenerated when the form of entry for a corporate body is changed. This means, therefore, that although one form of entry is used in creating records at any point in time, the data base as a whole may contain various forms of entry for the same corporate body.

Few corporate authors are entered in the indexing records, however, except for those of the USDA, State Extension Services, State Experiment Stations, and FAO. These are entered and may be searched by state, with the exception of extension publications of those land-grant institutions which do not include the name of the State in their names: Auburn, Clemson, Purdue, and Rutgers.

Personal Authors

Authors of an item up to the number of 10 are indexed. If there are more than 10, nine are listed and "et al" is generated by the computer in the tenth place of the author field.

The form of the names entered in this field follow the pattern, LAST NAME, INITIAL INITIAL. Note that there are no periods following the initials; thus, one would use "Smith, J F" as the entry in a search for articles by John F. Smith. The Indexing Section uses no

authority list for the establishment of personal names: the entry is generated strictly from the form appearing with the piece being indexed. It is conceivable, therefore, that there could be found in the data base several variant forms of entry in indexing records for articles by the same author. For instance, if John F. Smith signed his full name for one article, it would be entered with "Smith, J F" in the author field, but if he used only "John Smith" in another article, that work would have only "Smith, J" in the author field.

The use of initials for authors' given names raises another matter which must be remembered, that of retrieving totally irrelevant entries during searches of the author field. A search on "Smith, J F" will retrieve most of John F. Smith's articles in the data base, but that search will at the same time retrieve works by James F. Smith and Jason F. Smith. Irrelevancies can be minimized, however, by coupling the personal author's name with some other narrowing pieces of information, such as category codes or other subject related terms.

Unit Record Authorities

The form of entry for corporate authors, personal authors, and serial titles follows *Anglo-American Cataloging Rules*. Abbreviated titles of serials are constructed according to the rules of the American National Standards Institute. MARC language codes are used.

Authors' names and specialized vernacular terms, such as Russian *takyr* (soil), appearing in other than Latin or Romanized alphabets are transliterated according to the following systems:

1. Slavic languages in the Cyrillic alphabet including Russian, Ukrainian, Belorussian, Bulgarian, Serbian, Slovene, and Macedonian follow the Library of Congress system.
2. Chinese follows the Wade-Giles system.
3. Japanese follows the Hepburn system.
4. Korean follows the McCune-Reischauer system.

Diacritical marks in foreign names and titles are simply omitted, regardless of language.

Vocabulary Aids

Useful references for vocabulary choices are:

1. *Agricultural/Biological Vocabulary*, volume I and suppl., 1967 & 1968. Reprinted 1976.
2. Annual subject indexes of the *Bibliography of Agriculture*, particularly the 1969 index.
3. *Agricultural Terms, 1978*, Oryx Press, which will be useful for finding synonyms and related terms for searching.

C. ADDITIONAL AGRICOLA RECORDS

By far the largest single source of records in the AGRICOLA data base is the work input by the NAL Indexing Section. But substantial numbers of records are also prepared by the Cataloging Section at the Library and by staff members at the Food and Nutrition Information and Education Resources Center (FNIC) and at the American Agricultural Economics Documentation Center (AAEDC). This section will discuss the scope of the materials covered and the bibliographic records prepared by these units.

NAL CATALOGING PRACTICES

Approximately 14,000 records are input into the AGRICOLA data base by the Cataloging Section each year. These include cataloging records for periodical and other serial titles, monographs, translations, series analytics, and other such records for items that are entered into the catalogs at the Library. The next few paragraphs will elaborate on some of the NAL cataloging practices that have an effect on retrieval of information from the AGRICOLA tapes.

Main Entries and Titles

The Cataloging Section at NAL follows standard library cataloging practice in choice and form of entry for its records. Authority files are maintained by the section for both personal authors and corporate bodies. Insofar as is possible the Indexing and the Cataloging Sections use the same form of entry for corporate bodies. Personal authors' names are, however, much less uniform throughout the data base due to the AAEDC'S and the Indexing Section's practice of using an abbreviated form of personal names drawn directly from items as they are indexed. Thus, to retrieve items in the file by a particular author the searcher must use the formally established form of his name in order to retrieve cataloging records plus other forms of the name in order to retrieve indexing and AGECON records.

Cataloging records in the AGRICOLA data base vary from standard practice in that all diacritical marks are omitted, regardless of language, and titles of all foreign language items will be translated. Titles in languages not using Latin or Romanized alphabets will be transliterated as well as being translated.

Call Numbers

Since 1966 NAL has used Library of Congress classification. Prior to that time the Library used its own classification scheme (see the end of this part of the chapter for summary of the NAL scheme). There are no plans for reclassifying the collections, so many of the serial titles which appear in the AGRICOLA data base will bear the old NAL call numbers. New items added to long-established series which are analyzed by the Cataloging Section as well as items indexed from periodicals cataloged prior to 1966 will continue to be assigned the old NAL call number.

Knowing the NAL call number for long-established titles can help in trying to search for publications from a given source, such as State agricultural experiment stations or extension services. While governmental agencies and their publications exhibit the most frustrating proclivities toward name changes, call numbers tend to be rather more stable and are a good way

of searching for works issued by a given corporate source. For instance, 275.29 K13 with truncation will retrieve the items from Kansas State Agricultural Extension Service which were cataloged prior to 1966. One caution, however, must be observed when using this technique. The AGRICOLA data base is a cumulative record only; therefore, any changes that a serial undergoes which does cause a new cataloging record to be created will be reflected in the data base only from the time the new record is entered. Pre-existing records are not updated on the tape. The new serial record simply contains a note referring back to the old entry. The change is cataloged as a new item, but the previously assigned call number is retained for all the old records. Thus, if two serials, A and B, combine to form a new title, C, which has a new call number, the old records for titles A and B will not be updated in the data base. To perform a complete search then, one must use the call numbers for both the old and the new titles.

List of Journals Indexed, 1974-76, published 1978, indexed in the AGRICOLA includes NAL call numbers, which may also be found in *Serials Currently Received by the National Agricultural Library*.

NAL call numbers are always entered on the AGRICOLA tape with a space between the class number and the book number, e.g., 424.8 G47. LC call numbers, on the other hand, are entered without spaces except for a date as part of the number, e.g., SB351.P3P3 or TX739.C3 1971.

A lower case "a" before an LC call number, or a capital "A" before an NAL call number, identifies a publication issued by the U.S. Department of Agriculture. Other special types of materials are similarly identified, such as "Fo" for folios, "j" for juvenile literature, and "R" for items in the rare book collection. These designators are all shown ahead of the call number.

Subject Headings

NAL adopted Library of Congress subject headings beginning in July 1972. Prior to that it had used *National Agricultural Library Subject Heading List*. For thorough coverage of cataloging records throughout the data base, therefore, one should consult both authority lists for potential search terms.

All subject headings and geographic descriptors are entered into a separate field in the AGRICOLA unit record. Subdivisions to a subject heading are entered as separate tagged items in the unit record and generally must be searched separately. For example, the subject heading AGRICULTURE --- ECONOMIC ASPECTS will appear in most versions of the AGRICOLA record as two headings: AGRICULTURE and ECONOMIC ASPECTS. Treatment of the subject headings and geographic descriptors varies substantially from one retrieval system to another, so the search analyst should review the sections of this manual appropriate to the retrieval systems he expects to use.

Series Statements and Notes

The NAL Cataloging Section does analytics for all the major agricultural experiment station series and for major monographic series that fall within the defined scope of the NAL Collection. Series statements are prepared for cataloging records according to standard library practice. Because of limitations in the AGRICOLA record format, series statements can appear in the AGRICOLA unit record in either the Series field or the Notes field. A single series statement, or the primary series if more than one is to be entered, is placed in the Series field of the unit record. All additional series statements are entered in the Notes field.

Other information regarding such things as bibliographies, summaries in English or other languages, previous publication in another form, and so forth – that is, typical cataloging notes – will also be entered in the notes field.

Translations

The Cataloging Section processes several hundred items each year for the NAL Translation Collection. This collection consists of on-demand translations of book chapters, articles, papers, and reports purchased for USDA research staff. Over 2700 of these translations have been added to this collection since 1970. The call number for an item in the Translation Collection is simply TRANSL plus an accession number. In these records the original language titles appear, when available, as well as translated titles. All the items in this collection are tagged as monographs.

Titles and authors' names are entered exactly as given in the translation. Some variations, therefore, exist for items by any particular author. This is especially true of items in non-Roman alphabets because of variations in the transliteration schemes. All diacriticals are omitted.

This collection, and its handling, is separate from the indexing and storage of items from cover-to-cover translation journals, which are processed by the Indexing Section. There are also over 400 other translated monographic publications which are acquired by NAL and processed by the Cataloging Section for the library's regular collections. All of the translations in the AGRICOLA system are tagged in the Document Type field with TRANSL.

NAL CLASSIFICATION NUMBERS IN THE AGRICOLA FILE

These apply to serials and monographs in series which have not been converted to the Library of Congress Classification introduced in 1966.

- 1 USDA publications
 (Until November 1953 at which time subject classification preceded by the letter A was used. Use of "A" continued with changeover to LC classification in 1966.)

AGRICULTURE - U.S.

- 2 State agricultural reports
- 4 Agricultural societies
- 5 Agricultural congresses and conventions
- 6 Agricultural periodicals

AGRICULTURE - FOREIGN COUNTRIES

- 7 British America
- 8 Mexico, Central America, and West Indies
- 9 South America
- 10 Europe
- 11 Scandinavia and Iceland
- 12 Netherlands
- 13 Belgium
- 14 France
- 15 Spain and Portugal
- 16 Italy
- 17 Switzerland

- 18 Germany
- 19 Austria, Hungary, and Czechoslovakia
- 20 USSR, Finland and Poland
- 21 Balkan countries
- 22 Asia (except USSR)
- 23 Australasia
- 24 Africa
- 25 Other (Turkey, Philippines, Indonesia, etc.)
- 26 Tropical countries
- 27 Foreign congresses
- 28 International institutions
- 30 Agriculture in general

ANIMAL HUSBANDRY

- 40 Domestic animals: goats and rabbits
- 41 Veterinary medicine (Parasitic diseases in 436)
- 42 Horses
- 43 Cattle
- 44 Dairying
- 45 Sheep and wool
- 46 Swine
- 47 Poultry (wild birds in 413)
- 48 Dogs and pets
- 49 Livestock
- 50 Meat inspection

SOIL

- 54 Drainage
- 55 Irrigation
- 56 Soils
- 57 Fertilizers
- 58 Agricultural implements, machinery, and processes

CROPS

- 59 Cereals
- 60 Forage crops
- 61 Seeds
- 64 Crops (see also special crops 59-61, 65-77)
- 65 Sugar
- 66 Sugar beet
- 68 Sorghum and misc. sugar plants
- 69 Tobacco
- 70 Hops
- 71 Drug and medicinal plants
- 72 Cotton
- 73 Fiber and textile plants
- 75 Potatoes
- 77 Misc. technical plants
- 78 Rubber
- 79 Farm pests and weeds

HORTICULTURE

- 80 Horticultural periodicals
- Societies, boards, and institutions
- 81 United States
- 82 British America
- 83 Latin America
- 84 Great Britain
- 85 Germany
- 86 Other European except USSR
- 87 Asia, Africa, the East, and USSR
- 90 Horticulture in general
- 91 Vegetables
- 93 Fruits
- 94 Small fruits and nuts
- 95 Grapes
- 96 Floriculture
- 97 Gardens
- 98 Landscape art, parks, etc.
- 99 Forestry

AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS

- 100 United States
- 101 British America
- 102 Latin America
- 103 Great Britain
- 104 Scandinavia and Iceland
- 105 Belgium, Netherlands, France, Italy, Switzerland, Spain, Portugal, Germany, Austria, Hungary, and Czechoslovakia
- 106 USSR, Finland, Poland, Bulgaria, Rumania, Greece, and Yugoslavia
- 107 Asia
- 108 Africa
- 109 Australasia and Oceania

UNITED STATES PUBLIC DOCUMENTS

- 150 State Department
- 156 Dept. of the Interior
- 157 Dept. of Commerce
- 158 Dept. of Labor
- 166 Farm Credit Administration and Farmer Cooperation Service
- 173 Misc. agencies

- 270—
- 273 Statistics

- 275—
- 276 Education (includes extension)

ECONOMICS

- 277 Economic history
- 278 Economic geography
- 279 Conservation of natural resources
- 280 Economics: Cooperation, marketing, and planning
- 281 Agricultural economics
- 282 Land and rent
- 283 Labor and wages, etc.
- 284 Finance
- 286 Commerce
- 287 Boards of trade, chambers of commerce, and exchanges

TECHNOLOGY

- 288 Roads
- 290 Civil engineering
- 292 Water supply
- 293 Sewerage
- 294 Mining, metal working, and mineral industries
- 295 Refrigeration and cold storage
- 296 Architecture
- 297 Manufactures
- 298 Milling
- 300 Wood preservation, seasoning and drying (see also 464.07)
- 301 Wood distillation and wood waste utilization
- 302 Paper
- 303 Leather and fur industries
- 304 Textiles
- 305 Rubber
- 306 Paints, dyes and bleaches
- 307 Fats and oils, soap, lubricants, and waxes
- 308 Essential oils, perfumery, and flavoring extracts
- 309 Misc. manufactures
- 321 Home economics
- 325 Mathematics

PHYSICAL SCIENCES

- 330 Science -- general reports and research
- 331 Geography
- 332 Photography
- 333 Aeronautics
- 334 Physics
- 335 Electricity, electronics
- 340--
- 346 Meteorology

CHEMISTRY

- Periodicals and societies
- 381 U.S. and Canada
- 382 Great Britain
- 383 French
- 384 German
- 385 Other

- 386 General works
- 387 Analysis
- 388 Chemical technology
- 389 Food
- 390 Fermentation, enzymes
- 391 Toxicology
- 395 Agricultural chemistry
- 396 Pharmacy (veterinary drugs in 41)
- 398 Mineralogy
- 402 Paleontology
- 403 Geology
- 406-
- 407 Geological surveys
- 409-
- 410 Natural history
- 411 General zoology
- 412 Mammalia
- 413 Ornithology
- 414 Fishes

ENTOMOLOGY

- 420 Societies
- 421 Periodicals
- 422 General works
- 432 Economic entomology, insecticides
- 424 Apiculture (see also with prefix BEE)
- 425 Sericulture
- 427 Coleoptera
- 428 Diptera

- 436 Worms and animal parasites
- 439 Protozoa
- 440 Microscopy
- 442 Biology
- 443 Evolution, genetics and heredity
- 444 Comparative anatomy and physiology
- 447 Human anatomy, physiology and histology
- 448 Medicine (Parasitic diseases in 436)
- 449 Hygiene

BOTANY

- 450 Periodicals
- 451 Societies, boards, institutions
- 452 Systemic and descriptive catalogs
Geographical
- 459 Europe
- 460 Asia

- 462 Fungi
- 463 General works, textbooks and handbooks
- 464 Phytopathology

SCIENTIFIC PERIODICALS

- 470 American
- 472 English
- 473 French
- 474 German
- 475 Other

LEARNED SOCIETIES

- 500 United States
- 501 Great Britain
- 502 Scandinavia and Iceland
- 503 Netherlands
- 504 Belgium
- 505 France
- 506 Spain and Portugal
- 507 Italy
- 508 Switzerland
- 509 Germany
- 510 Austria, Hungary, Czechoslovakia, and Yugoslavia
- 511 USSR and Finland
- 512 Greece, Rumania, Bulgaria, Poland, and Albania
- 513 Asia
- 514 Australasia
- 515 Africa
- 516 Latin America
- 517 British North America

FICHE

FILM

TRANSL

Prefixes to call numbers besides "A" for USDA publications

BEE or BEE CULTURE formerly in Bee Culture Library

FO or FOLIO Folio size materials

MAP Maps

R Rare books

These prefixes have a space between them and the class number. The "A", meaning USDA publications, does not.

For classification numbers used since 1965, see the Library of Congress classification scheme.

Food and Nutrition Information Center (FNIC) Records

The Food and Nutrition Information and Education Resources Center was developed cooperatively by the National Agricultural Library and the Food and Nutrition Service of the U.S. Department of Agriculture. The Center's primary function is to disseminate information on institutional food service and nutrition education.

The Center assembles and maintains a collection of materials on nutrition education and food management that are useful to school food service personnel, researchers, educators, dietitians, nutritionists, and consumers. Food service management and training, food habits, and various aspects of food technology are among the topics covered by FNIC.

The materials in the Center include books, journal articles, pamphlets, government documents, special reports, proceedings, bibliographies, etc. In addition, FNIC maintains a collection of non-print media in the form of motion pictures, filmstrips, slides, games, charts, audiotapes, and video-cassettes. Materials of substantial interest to the school food service and nutrition education community are selected for inclusion in the printed catalogs of the Center; these items are also included in the AGRICOLA tapes.

Items from the FNIC collection are indexed using a specialized controlled vocabulary that was developed for this collection. Many of these controlled subject terms are multi-word phrases that can be searched in the precoordinated forms directly, e.g., PLANT PROTEIN CONCENTRATES or SYNTHETIC FOODS. Check individual system sections for searching these terms.

An informative abstract, extract, or annotation is part of each FNIC record. The controlled vocabulary and the abstracts are supplemented by the assignment of a numerical subject code to each item (see the end of this section for a complete list of the codes). Some of the category code numbers used by the Food and Nutrition Information Center overlap the category codes used by the NAL Indexing and Cataloging Section. Because the subject scope of the FNIC codes is slightly different from the scope defined for identical Indexing/Cataloging category codes, the user should be careful when utilizing them in a search strategy.

Users who anticipate heavy use of AGRICOLA for searching the FNIC files may wish to acquire a copy of the controlled vocabulary used by the Center's staff. It can be obtained directly from the Food and Nutrition Information Center, Room 304, National Agricultural Library, Beltsville, Maryland 20705. Printed copies of the FNIC catalogs are also valuable as search tools and copies may be obtained by writing the Center.

Because FNIC indexes the items in its file more freely than does the NAL Indexing Section, little use is made by the FNIC of title enrichment -- with the notable exception of audiovisual materials. The title of each piece in the Center's educational media collection is enriched with the term or terms denoting its format, e.g., USING STANDARDIZED RECIPES (FILM LOOP). These enrichment terms are extremely useful in retrieving particular types of teaching aids.

The following terms are used for title enrichment by indexers at the Center:

Audiotape	Filmstrip	Poster
Cartoon	Game	Record
Cassette Tape	Kit	Show 'N Tell
Chart	Model	Slide
Coloring Book	Motion Picture	Study Print
Crossword Puzzle	Phonodisc	Transparency
Film Loop	Playing Cards	Videocassette

Each of these terms may also appear in its plural form, and some of the terms may be more likely to appear in that form -- e.g., slides and transparencies. Because these terms are part of the title field, they are searchable as single word entries; so in order to retrieve a particular type of media, one must use the same searching techniques that he would employ to search other title words.

FNIC CATEGORY CODES

1505 Consumer Education

Consumer Economics, Consumer Protection, Open Dating of Food

1510 Nutritional Science and Nutrition Education

Diets, food analysis, food and/or nutrition related diseases or disorders, food habits, food science, health, malnutrition, nutritional surveys, general works on nutrition education

1520 History

Historical works tracing the history of food programs, general works on foods and the food service industry, food problems

1525 Food Standards and Legislation

Food grades, food standards, labeling, food and nutrition related legislation

1530 Management and Administration

Administration, Computer applications, Contracts, Financial management, Food Service management, Personnel Management, Marketing, Food Preference Surveys, Public Relations

- 1535 Education and Training
 - Adult Education, Career Education, Curriculum, Educational Planning, Educational Programs, Audiovisual Aids, Teaching Techniques, Personnel Training, Inservice Education, Vocational Guidance
- 1540 Menu Planning
 - Cycle Menu, Menu Design, Meal Management, Automated Menu Planning
- 1545 Food Preparation and Production
 - Quantity Food Preparation, Food Delivery Systems, Weights and Measures, Merchandising
- 1550 Equipment
 - Cooking Equipment, Cleaning Equipment, Facilities Planning and Design, Waste Disposal Equipment, Equipment Standards, Equipment Storage
- 1555 Sanitation and Safety
 - Food Sanitation, Equipment Sanitation, Pest Control, Hygiene, Safety, Accident Prevention, Food Borne Illness
- 1560 Food Technology
 - Food Packaging, Food Processing, Food Preservation, New Products
- 1565 Programs-General
 - International, National, State, and Local Programs, Food Programs, Federal Programs
- 1570 Recipes
 - Cookery native to a specific country or locale, the art of cooking, recipes
- 1575 Reference Materials
 - Directories, Dictionaries, Statistical Data, Food Composition Tables, Information Science
- 1580 Purchasing, Receiving and Storage
 - Care and Handling of Food, Food Selection, Food Storage, Food Delivery, Purchasing of Food and Equipment

American Agricultural Economics Documentation Center (AAEDC) Records

The American Agricultural Economics Documentation Center (AAEDC) was established in 1970 through the cooperative efforts of the American Agricultural Economics Association, USDA's Economic Research Service, the Statistical Reporting Service, and the National Agricultural Library. The purpose of the Center is to collect and document the literature of agricultural economics, thus gaining better bibliographic control. Dissemination of bibliographic information on agricultural economics is achieved through the Center's data base, AGECON (*Agricultural Economics*). NAL's computerized bibliographic system has been used by the Center since late 1970 for creation and storage of citations, but until 1976 those records were not made available on the sale tapes supplied by NAL to its subscribers.

In January, 1976, all the AGECON records (over 5,000 of them) were added to the sale tape, and since that time the records prepared by the AAEDC have been made available as part of the monthly AGRICOLA sales tapes. The AGECON file contains over 6,866 (end of 1977) citations and is increasing by approximately 200 references with each monthly update.

The information in the AGECON file was used to produce the *American Bibliography of Agricultural Economics (ABAE)* until it ceased publication in 1974. There was no regularly published product nor easy access to this file after the *ABAE*'s demise until January 1976 when the retrospective file was made part of AGRICOLA. Beginning in April 1977 the AAEDC records for articles on agricultural economics (approximately 75% of the records processed by the center) will be published in the *Bibliography of Agriculture*. The AGECON records will be integrated into the existing *B of A* subject category scheme, with most of the references appearing in the agricultural economics categories 1005 through 1030.

Recently a subfile of AGECON called AGC, containing citations relevant to Canadian agricultural cooperatives, was made a part of the database. This subfile is being prepared by the Cooperative Unit, Economics Branch, Agriculture Canada in cooperation with the Library of Agriculture, Canada. It is hoped that this project will be the prototype of a much expanded effort to cover comprehensively all Canadian agricultural economics literature.

Scope

Journal articles (see subscription list at the end of this part of the chapter), government documents, publications from universities, experiment stations, and extension services are selected for inclusion in the AGECON file. Conference and symposium proceedings and other items judged to be of interest to agricultural economists are also included. The emphasis in this collection is the work done by the United States and Canadian agricultural economists or for organizations in the U.S. and Canada.

Selection Guidelines

The AAEDC has established guidelines regarding the format and content of items selected for inclusion in the AGECON file. These guidelines are outlined here.

- A. Publications meeting requirements in the categories below will be included in AGECON.
1. All articles in major agricultural economics journals (AJAE, SJAE, NAEC Journal, WAEA Journal, CJAE, Canadian Farm Economics).
 2. All materials published and/or authored by faculty and researchers at college and university agricultural economics departments. (Includes staff papers and other departmental series, regardless of whether formally reviewed.)
 3. All journal articles and monographs authored by agricultural economists at State Experiment Stations and Extension Services.
 4. Other items applicable to research needs of agricultural economists, for example:

- a. articles on economic models which are applicable to agriculture
 - b. contributed papers at professional meetings
 - c. substantive speeches relating research results or major issues, which are not ephemeral and appeal to a wide agricultural economics audience.
- B. The following items will not be included in AGECON.
- 1. Speeches (except as in 4c above).
 - 2. Material specified (in writing) to be for internal use only, for example ERS working papers.
 - 3. Popular publications, regardless of authorship, intended for use by the general public, for example, a leaflet describing USDA in general terms.
 - 4. Statistical compilations covering *less* than a 1-year period.
 - 5. News releases.
 - 6. Items in trade publications promoting specific brands of agricultural equipment or products.

Indexing Practices

The AAEDC staff members maintain a controlled vocabulary which is used for indexing the items going into AGECON. Terms from this list are entered in the Descriptor field of the unit records. In addition an informative abstract or extract is prepared for most records.

From 1970 until the end of 1976 AAEDC used its own set of category codes for assignment to references (see the end of this section for a complete listing). Code numbers 1010, 1020, and 1030 duplicate codes used by NAL with slightly different scope. The searcher needs to exercise caution, therefore, when incorporating these codes into search strategies. Since January 1977, however, the AAEDC codes have been discontinued, and AGECON records now conform to the agricultural economics codes used by NAL.

Any questions regarding AGECON can be addressed to:

American Agricultural Economics
Documentation Center
Room 146, GHI Building
500 12th Street, S.W.
Washington, D.C., 20250
Telephone: (202) 447-2474

Journal Subscriptions

American Journal of Agricultural Economics
Canadian Journal of Agricultural Economics
Food Research Institute Studies in Agricultural Economics, Trade, and Development
Journal of the American Society of Farm Managers and Rural Appraisers
Journal of Economic History
Journal of Forestry
Journal of Leisure Research
Journal of the Northeastern Agricultural Economics Council
Journal of Political Economy
Journal of Range Management
Journal of Regional Science
Journal of Soil and Water Conservation
Land Economics
Rural Sociology
Social Science Quarterly
Southern Economic Journal
Southern Journal of Agricultural Economics

AGECON CODES

1010 Agricultural Marketing

Input and output markets; market power, costs and efficiency; industrial organization and market structure; policy on marketing regulations; prices and pricing; transportation; wholesaling and retailing; new products; bargaining; futures markets; market institutions; market orders; market boards; cooperatives.

1020 Agricultural Policies and Programs

Production adjustments and supply control; income augmentation; credit and finance; housing improvement; economic planning; food distribution programs; trade policy; land tenure; commercial agriculture; subsidized exports.

1030 Agricultural Products, Demand, Supply and Prices

Demand, supply and price; outlook projections and forecasting; input-output analysis of agriculture in the national economy; farm income; functional coordination; sector analysis; interregional competition.

1040 Food and Consumer Economics

Food situations - supply and needs; food expenditure and consumption; food cost and market spreads; food prices; away-from-home eating; consumption patterns, habits and preferences; nutrition.

1050 Foreign Development

Producer economies; marketing economies; internal policies; industrialization; agrarian reform; trade analysis; development planning; income distribution.

1060 Production Economics and Farm Management

Farm organization and management; farm enterprises, practices, technology and input combinations; farm finance and capital; agricultural risk and returns; structure of agriculture and economics of farm size; farm and land values and valuations; industrial inputs; organization and management; farm records and accounting.

1070 Regional and Human Development

Rural and farm population; migration; manpower training; industrial development; levels of living; local, county, and state governments; low-income areas and people, interregional and interindustrial structure; employment opportunities; regional economic development; area adjustments in the urban rural fringe; impact of urban growth on rural areas; rural sociology dealing with this category; public services; income sources and distribution.

1080 Resource Economics

Land utilization; land tenure; water utilization; watershed development; resource institutions - water rights and legislation, land use regulations, resource districts and organizations; outdoor recreation; resource productivity and income distribution; resource use planning; incidence of benefits and costs; environmental quality; pollution.

1090 General

Economic theory; methodology; agricultural history; other topics.

1015 Agricultural production costs and returns

General agricultural finance. Cost factors: land, capital, materials, labor (wages, incentives, bonuses), overhead; credit and interest rates; taxes; insurance: fire, accident, unemployment, social security, health, etc. Pesticides, fertilizer and agricultural equipment costs as they relate to agricultural production (otherwise in 4560, 6010, and 5510).

selling, processing, and distribution costs; farm income; return on farm investment.

Farm losses from the economic aspect. Not to include processing industries costs and returns unless they are part of agribusiness.

For forestry costs and returns see 3510.

For cost and return planning see 1010.

1020 Agricultural production distribution (farm products)

Supply and demand, including affecting factors as consumer preferences, consumer purchasing power, etc.

Prices: determination, control, cycles, fluctuations, inflation, indexes, trends, etc.
Price support programs and subsidies.

Domestic trade, marketing, transportation, advertising; foreign trade, import quotas, commodity agreements; surplus disposal.

For marketing cost and return material as a part of agribusiness or farmer operations see 1015.

For forest products see 3520.

For fertilizer as a product see 6010.

For pesticides as a product see 4560.

For farm equipment as a product see 5510.

1025 Statistical data and methodology

Discussions of agricultural statistics. Statistical methods and theory as applied to agriculture, in general; as applied to specific subjects, place in that subject category: e.g., statistical methods of plant genetics in 4025. Includes compilation of statistical data on crops, livestock, products, acreage and area, etc., that would support management and policy decisions.

For forestry statistics see 3510.

1030 Outlook, policies, programs and legislation

Productive capacity of agriculture. Population and food supply problem and programs. Control of production, production goals, surplus situation.

Agricultural relief and reconstruction, foreign aid, and technical assistance programs.

Soil bank program, agricultural conservation programs, rural development, subsidies.

Situation and outlook of agricultural industries (rubber, coffee, poultry, etc.) from an economic point of view. Large scale planning, location theory.

General and specific agricultural legislation; all legislation is here, but may be double indexed to the specific subject category.

Environmental Impact Statement Records

Beginning with the sale tapes for November 1978, a subfile consisting of 525 environmental impact statements related to agriculture and natural resources was incorporated into AGRICOLA. Updates to the subfile are planned to be quarterly.

The citations are taken from *EIS (TM): Key to Environmental Impact Statements* published by Information Resources Press through a working agreement with USDA. A profile has been established for computerized determination of citations to be incorporated into the subfile. All USDA environmental impact statements will be included plus others on a subject or corporate source basis. The records added from *EIS (TM)* contain most of the data elements found in the publication, including:

- Author (almost exclusively corporate bodies)
- Title
- Date of publication
- EIS (TM)* accession number (augmented by NAL)
- Pagination or number of volumes
- Keywords (descriptors, geographics, and corporate added entries) as applied by *EIS (TM)*

The abstracts and related narrative summaries of the documents are not available in this subfile, but the accession numbers will lead the user to relevant document summaries in the *EIS (TM)* published service. Accession number prefixes in this subfile have been changed from *EIS* to NAL ENV, but number designations have remained the same. Accession numbers for draft impact statements are suffixed with a D.

Subfile records are augmented in two ways. First, each record contains instructions for obtaining the full impact statement. Second, NAL subject category codes are assigned to the records to enhance their retrievability. These items have been tagged with the three-character label ENV so that the subfile can be searched as a separate part of the AGRICOLA database.

There has been no augmentation or changing of the basic data elements included in the *EIS (TM)*. Check system-specific sections of the manual for protocols required to search controlled vocabulary unit record fields.

Brucellosis Subfile

The November 1978 AGRICOLA tape update contains the first 1,845 additions to the database in the Brucellosis subfile, derived from a rapidly growing file of over 3,500 citations. The remainder of these 3,500 references plus new accessions are scheduled to be added to AGRICOLA in the near future. In this file the world literature about this disease which affects both livestock and man has been gathered and organized by the staff of the Cattle Disease Program, Animal and Plant Health Inspection Service (APHIS). The subfile contains significant references to literature on monitoring, controlling and eradicating the disease from the late nineteenth century to the present. Coverage of post-1969 published literature is, however, more comprehensive than works published earlier on this topic.

Materials selected for the subfile include both monographic works and serial publications. All aspects of brucellosis are included in the subject coverage of the file, including its etiology, epidemiology, pathology, treatment, prevention, and economic impact. References are to items in either English or English translation. A number of significant foreign language items with substantial abstracts or summaries in English are included as well.

All records in the Brucellosis subfile are tagged with the three-character label BRU so that, if desired by the analyst, this subfile can be searched as a separate entity within the AGRICOLA complex of databases.

Brucellosis records are compatible in their searchable elements with other AGRICOLA records, that is, they may be searched by title, author, descriptor, etc. A controlled vocabulary based on the *Thesaurus of Animal Disease* and enriched with terms unique to this disease is used in assigning subject descriptors to records in this subfile. For information on the availability of this thesaurus, write to --

Emergency Programs, Veterinary Services
Animal and Plant Health Inspection Service, USDA
Room 756, Federal Center Building No. 1
Hyattsville, Maryland 20782

D. CATEGORY CODES (1972-)*

GENERAL AGRICULTURE & RURAL SOCIOLOGY

0505 General agriculture and rural sociology

General description of U.S. and world agriculture. Agricultural history in general: prehistoric, ancient, medieval, and modern. Biographies, geographies, maps, atlases, travels.

Education: teaching, extension, demonstration, and advisory work. Short courses, correspondence courses, schools - all levels. TV, radio, and agricultural journalism.

General proceedings, annual reports and acts of agricultural institutions, societies, cooperative associations, and chambers of agriculture. Specific kinds of cooperative associations go with subject.

Techniques and methods of agricultural research.

Agricultural meteorology and climate in general.

Any of above go with a specific subject category as appropriate.

Human ecology, social psychology, social effects, social institutions. Rural organization and movements, leadership, farmer political power, Health, welfare, etc., affecting family life. Rural-urban relations. Population migration to urban areas. Social aspects of migratory and contract labor, women as laborers, sharecroppers, etc. Cost and standard of living.

For home demonstrations and home economics see 1515.

Includes any agricultural item too general for other categories.

AGRICULTURAL ECONOMICS

1005 General agricultural economics and land economics

General description of U.S. and world agricultural economics. Agriculture and industry - economic relations. Economic associations, history, education, biographies, etc.

Land settlement and colonization, rent, valuation. Land classification, utilization, multiple use. Recreational use of farm land, shifting cultivation, conversion of land to non-agricultural uses, rural-urban fringe, land zoning. Tenure, farm mergers, consolidation of holdings. Land or agrarian reform. Regional planning involving land only.

*See Appendix D for a summary of NAL Category Codes (1972 -)

For location theory see 1030.

For forest land use see 3510.

1010 Agricultural administration and management

Organization and administration of national and international agriculture in general; public relations, personnel on local, regional, central, public, governmental, non-governmental, international levels.

Farm management: operation of farms to obtain maximum amount of continuous net income. Alternative systems of farming, budgeting, accounting, cost and return planning, input-output analysis, programs of adjustment, integration, etc.

Collective farming, state farms, contract farming, cooperative farming, corporation farming, part-time farming, share farming, tenant farming, etc.

Machine tractor stations, repair and technical stations not including purely sociological or technical aspects.

Labor: requirements and productivity. Economic aspects of migratory and contract labor, women as laborers, share-croppers, unions, etc.

Agribusiness, vertical and horizontal integration of farming. Not to include labor and management problems of processing industry unless it is part of agribusiness.

For forest management see 3510.

For actual costs and returns see 1015.

CONSUMER PROTECTION AND NUTRITION

1505 Consumer protection

Consumer oriented research on food and textiles and on other agricultural products through the processing stages, not on the manufactured product (c.g., cigarettes)

Agricultural products: grading, inspection, regulation, standardization, quality control. Purity, contamination, adulteration, decontamination, residues, food poisoning, spoilage, fraud from the point of view of the consumer.

Includes equipment for grading and inspection of food.

Includes contamination of fish as food.

Any of the above aspects concerning feed are in 2035.

For pesticide contamination double index to 4560.

For other aspects of agricultural products see categories 2005–2030.

For other aspects of food research see 1510.

1510 Human nutrition

Metabolism and utilization of nutrients. Nutrient requirements. Relation of nutrition to physiology.

Food: nutritive value, vitamin research. Food consumption (diet), food habits, and fads, etc. Home and institutional cookery.

Nutritional deficiencies, malnutrition, human diet in relation to health and disease.

Includes nutrition research on laboratory animals.

For livestock nutrition research see 2515.

1515 Home economics

Clothing and textiles, home furnishings and decoration, household accounts, household equipment; both rural and urban. Family living and management practices. Home demonstrations.

For family and community relationships see 0505.

AGRICULTURAL PRODUCTS

2005 Agricultural products – general

General material relating to more than one category of products and specific products which fall in no other groups (e.g., beverages, condiments, honey and beeswax, rubber, silk, bamboo, hops, fish as food, beer or margarine when ingredients are not mentioned, etc.)

Industrial utilization. Chemurgy. Analysis and composition. Processing: preparation methods such as pasteurizing, curing, canning, dehydrating, freeze-drying, freezing, preserving, irradiation, etc. Home and industrial processing.

Care, storage, refrigeration, and sanitation procedures for food and non-food agricultural products. Rodent control measures. Biochemistry of stored products.

For insect pests see 4550.

For effect of sanitation procedures on humans see 1505.

For cookery see 1510.

For storage diseases and plant products see categories 4505–4520.

2010 Dairy products Same as 2005, except 1st paragraph

2015 Livestock products Same as 2005, except 1st paragraph
Includes slaughtering.

2020 Poultry products Same as 2005, except 1st paragraph
For eggs for hatching see 2520.

2025 Field crop products Same as 2005, except 1st paragraph

2030 Horticultural products Same as 2005, except 1st paragraph

2035 Feed products Same as 2005, except 1st paragraph
Includes silage, hay, meals, fodder, fish as feed, etc.

Includes all aspects of consumer protection 1505 as it applies to feed.

For effect of feed on animals see 2515.

ANIMAL SCIENCE

2505 General and miscellaneous animal husbandry

Includes cattle, buffalos, camels, yaks, llamas, reindeer, horses, mules, sheep, goats, swine; poultry: chickens, turkeys, ducks, and geese; dogs, cats, rabbits, laboratory animals, fur animals pen raised; fish culture as part of farm operations, not fish hatcheries.

Production and care of domestic animals. Rearing, judging, testing, training, housing; branding and other identification; livestock shows; sexing, predators of livestock.

For construction of animal housing see 5505.

For animal breeding, artificial insemination, etc. see 2520.

2510 Livestock biology

Biology, anatomy, cytology, histology, morphology including teratology, physiology including metabolism, biochemistry, ecology, behavior, paleontology. Environmental biology, external influences on biological processes. Biology of rumen microorganisms.

For external influences with harmful effects see 3020.

For biological aspects of diseased animals see the appropriate disease category.

For biological aspects of reproduction see 2520.

Includes physiology of nutrition and effect of rumen microorganisms and other digestive tract organisms on nutrition.

2515 Livestock feeding

Feeds and animal nutrition; nutritive value of feeds, feed formulas, feedlots, feed supplements; effects of feeding.

For biological effects of feeding see also 2510.

2520 Livestock breeding

Breeds, types, varieties; fertility (which is often mentioned as “reproduction”), sterility, artificial insemination, genetics, pedigrees; parturition, egg hatching, predetermination of sex, sex reversal, twinning. Estrus; pregnancy; semen; effects of breeding; physiology of reproduction.

VETERINARY MEDICINE

3005 Veterinary medicine

General; as a profession, societies, education; dehorning, castration, surgery, anaesthesia; diagnostic techniques; animal quarantine, health problems, sanitation inspection of farm and slaughterhouse.

Any of the above go with a specific subject category as appropriate.

General articles on animal diseases go here.

3010 Infectious and parasitic diseases

Contagious diseases: bacteria, viruses, fungi (mycoses), Rickettsia, Mycoplasma, pleuropneumonia-like organisms, protozoa; Parasitic diseases: parasitic worms, such as trematodes, nematodes, helminths, flukes, etc. Vaccines, immunization, immunogenicity, antigens, antibodies: causes, control, diagnosis, prevention, transmission, treatment.

Double index insect vectors to 4555.

3015 Non-infectious diseases

Physiological, metabolic, nutritional (deficiency diseases), hereditary; neoplasms: causes, control, diagnosis, prevention, treatment, allergy.

For nutritional deficiencies see also 2515.

3020 Miscellaneous diseases and injuries

Diseases and injuries caused by physical agents (including radiation), chemical agents, toxic substances, pesticides, poisonous plants, foreign bodies, vices (cannibalism, tail biting, feather picking, etc.), etc.

For effects of environmental stress see also 2510.

FORESTRY

3505 Forestry – general

Associations, history, education, social and economic aspects of forestry as a whole. Techniques and methods of forestry research. Specific research goes with subject.

Forest influences: effects upon water supply, soil, climate, and health resulting from the presence of forests. Includes shelterbelts and windbreaks. Watershed management.

Forest fire research: prevention and control.

Injuries caused by man, animals, weather; pollution. Includes methods of prevention and control: natural and biological, silvicultural, physical and mechanical, chemical.

For nematodes as pests and other diseases of forest trees (except injuries) see 4505–4520.

For weeds and parasitic plants of forest trees see 4525.

For insect pests of forest trees see 4545.

3510 Forest economics and management

Business economics of forestry both domestic and foreign. Administration and organization of forest enterprises. Forest finance, valuation, and statistics. Land-use policy, including multiple use for maximum efficiency, management of recreational resources on forest lands, such as parks; includes taxation, regulation and legislation, cost and return aspects, consolidation of holding, ownership, labor.

National forest resources, experimental forests, private forests, farm woodlands. Forest engineering. Forest conservation.

Forest mensuration: systems and units of measurement of trees, stands, timber; increment and yield tables. Site index and site quality. Surveying and mapping; aerial surveys; photogrammetry.

3515 Silviculture

Care of forest trees. Silvicultural systems, artificial regeneration, breeding and genetics, seed productions. Timber stand improvement, minor forest husbandry including Christmas trees and forest nurseries. Prescribed burning, killing, afforestation and reforestation.

For study of forest soils see 6005.

For forest fertilizers see 6010.

For forest drainage and irrigation see 6020.

For taxonomy, ecology, morphology, anatomy (except wood anatomy see 3520), and cytology of forest trees see 4010-4020.

For physiology and biochemistry of forest trees see 4045.

For range management see 4050.

For silvicultural equipment see 5510.

3520 Forest industries

Harvesting, logging, transportation, sawmills, and equipment. Primary and secondary processing. Timber manufacturing industries and products, pulp and paper industries, bark products, Christmas trees, and other minor forest products. Logging residues. Veneers, plywood, and built-up-stock, chemical products and distillates, naval stores. Honeycomb cores, sandwich construction materials, plastic laminates, joints and fastenings; general utilization. Grading, seasoning, control of decay (wood rotting fungi), preservation and treatment, painting and fireproofing.

Trade, marketing, prices.

Wood technology: research studies on wood in all its aspects. Identification and characteristics, structure and chemistry, mechanical and physical properties. Cellulose and lignin research whether wood product or general.

For insect pests of forest products see 4545.

For pulp from grasses, bagasse, castor bean, bamboo, etc. see 2005.

PLANT SCIENCE

4005 General plant science

Associations, history, education; introduction of plants; arboretums, herbariums, botanical gardens, notable trees; techniques and methods of botanical research. Specific research goes with subject. Ethnobotany; botanical explorations; conservation of plants.

Any of the above go with a specific subject category as appropriate.

4010 Plant taxonomy and geography

Orderly classification of plants, including mechanisms underlying speciation and related processes. Plant geography, floras, cytotaxonomy, chemotaxonomy, and nomenclature. Paleobotany and fossil pollen. Checklists of plants.

4015 Plant ecology

Interrelationships of plants with their environment. Includes forest ecology (forest types), indicator plants, plant associations, vegetation.

4020 Plant morphology, anatomy and cytology

Includes histology, teratology, ultrastructure.

Includes forest trees.

For anatomy of wood see 3520.

4025 Plant genetics and breeding

Includes cytogenetics. Breeding for disease resistance; breeding for insect resistance. Double index breeding for disease or insect resistance.

For forest tree genetics and breeding see 3515.

For physiology of plant reproduction see 4030–4045.

4030 Plant physiology and biochemistry – general

Growth and growth regulators. Nutrition and nutritional deficiencies. Pollination, metabolism, transpiration, etc. Physiological effect of environmental factors; hardiness, etc. Tissue culture.

Includes miscellaneous economic plants. (For list see 4060)

Includes any plants of unknown use.

General material relating to more than one category of crops.

For deficiency diseases see 4520.

4035 Physiology and biochemistry of field crops

Same as 4030.

For list of plants see 4050.

4040 Physiology and biochemistry of horticultural crops.

Same as 4030.

For list of plants see 4055.

4045 Physiology and biochemistry of forest trees

Same as 4030.

4050 Field crops – culture (from planting to harvesting)

Agronomy; varieties, and yields. Crop rotation. Management of ranges, pastures and meadows, grazing practices. Defoliants as harvesting aid.

Grain crops, forage crops, grasses, edible oil crops, cotton and other fiber crops, sugar crops, tobacco, peanuts, soybeans and other field crops.

A number of crops can be placed here or in horticultural crops depending on their use: e.g., broadbeans, olives, coconuts, turnips, beets, etc.

Grazing practices and range management may be double indexed to 2515.

4055 Horticultural crops – culture (from planting to harvesting)

Horticulture; varieties, and yields. Crop rotation. Orchards, nurseries, gardens. Landscaping; highway beautification. Defoliants as harvesting aid.

Citrus, tropical, subtropical, deciduous, and small fruits; nut crops; vegetable crops; root and tuber crops (includes cassava). Shade trees and ornamental plants. Turf and golf greens, roadside plantings.

Includes harvesting of wild berries, nuts, mushrooms, etc.

4060 Miscellaneous economic plants – culture (from planting to harvesting)

Varieties and yields.

Beverage plants, flavoring, essential oil, hops, bamboo, rubber plants, pigment, tannin, tung oil and other industrial oil plants, drug plants, divinatory plants, plant sources of insecticides, honey plants, etc.

There is no general category for culture so if more than one crop category is mentioned the item is assigned to the most important category or each crop is indexed.

PLANT DISEASES, INSECT PESTS, AND CONTROL

4505 Plant fungus diseases and control

Includes diseases in storage

Includes forest trees.

Double index when insect vector is known.

For wood rotting fungi see 3520.

4510 Plant bacterial diseases and control

Includes diseases in storage.

Includes forest trees.

Double index when insect vector is known.

4515 Plant virus diseases and control

Includes diseases in storage.

Includes forest trees.

Includes mycoplasmas.

Double index when insect vector is known.

4520 Miscellaneous plant diseases, injuries and control

Nematodes (includes nematodes of forest trees), physiological diseases, deficiency diseases; injuries caused by weather and equipment; plant protection, including irrigation and wind machines; plant quarantine; animal pests (other than insect) of plants; pesticide toxicity to plants; radioactive contamination of plants; nematocides, rodenticides, molluscicides, and other agents used in control. General material on all diseases and pests of a plant or plants.

For free-living soil nematodes see 6005.

For injuries of forest trees see 3505.

Pollution damage may be double indexed to 6505.

Includes items covering more than one disease category.

4525 Weeds and weed control

Occurrence and distribution of weeds.

Weed control: chemical, cultural, and biological. Parasitic and poisonous plants.

For effect of poisonous plants on animals see 3020.

For physiological effect of herbicides see also 4030–4045.

For toxic effects of herbicides on organisms other than weeds see appropriate specific categories and double index as needed.

4530 Insect pests and control – general, and miscellaneous plants

General items where the name of the host is not given and also where the host is any plant not covered in categories 4535 (field crops), 4540 (horticultural crops), or 4545 (forest trees and products). Includes items covering more than one crop category.

Insects as pests and their control: biological, chemical, cultural, integrated, natural, etc. Insect resistance to insecticides; toxicity of pesticides to insect pests; insecticides, acaricides, chemosterilants, attractants, repellants, hormones, and radiation sterilization; insects as vectors of diseases; host resistance.

Plant quarantine regulations covering insects only, otherwise in 4520.

See also 4535, 4540, 4545.

For physiology of insect pests see also general entomology 5005.

For equipment for pest control see 5510.

4535 Insect pests and control – field crops

For partial list of field crop types see 4050. Otherwise as 4530.

4540 Insect pests and control – horticultural crops

For partial list of horticultural crop types see 4055. Otherwise as 4530.

4545 Insect pests and control – forest trees and wood products

See 4530.

4550 Insect pests and control – products

Pests attacking stored products and processed commodities, in the household, industry, warehouses, and on the farm, including control by any means.

See 4530.

For insect pests of forest products see 4545.

4555 Insect pests and control – animal and man

Pests attacking man, domestic animals, birds, and wildlife, including control by any means.

See 4530.

Double index insects as vectors of disease to the disease if livestock are involved.

4560 Pesticides – general

General items on pesticides which cover more than one specific group of pesticides and items which mention a pesticide or pesticides but no specific host or insect.

Industry, technology, prices.

Toxicity and harmful side effects to man, birds, wildlife, fish, beneficial insects.

Double index toxicity to honey bees to 5015.

Residues and tests for residues. Double index residues in food to 1505, in feed to 2035.

For toxicity and harmful effect to insects pests see 4530–4555.

For toxicity and harmful effect to livestock see 3020.

For toxicity and harmful effect to plants see 4520.

If a pesticide is not in a 4505–4555 or 3020 category it is placed here and double indexed as needed.

ENTOMOLOGY

5005 General entomology

Biology, anatomy, cytology, histology, morphology including teratology, genetics, physiology including metabolism, biochemistry, ecology. General pathology. Insects other than honey bees as pollinators. Articles on pollination may be double indexed to plant physiology categories 4030-4045. Paleoentomology.

Includes: Insecta, Myriopoda (Diplopoda, Pauropoda, Chilopoda, Symphyla), Arachnida, Isopoda (terrestrial only), and Onychophora.

5010 Taxonomic entomology

Systematic arrangement of insects into a system which exhibits their relationship to each other and their places in a natural classification. Includes descriptive and geographic entomology.

5015 Apiculture and sericulture

Honey bee culture, breeding, biology, pests, and pathology; honey bees as pollinators. Includes *Apis mellifera* (or *mellifica*), *A. dorsata*, *A. florea*, *A. indica*, *A. mellifera adansonii* (African bee), etc.

For products of the hive see 2005.

Silkworm culture, breeding, biology, and pathology. Includes *Bombyx mori*, *Anthereaw pernyi*, *Samia cynthia ricini*, etc.

For silk see 2005.

Includes beekeeping and silkworm culture equipment.

AGRICULTURAL ENGINEERING

5505 Agricultural engineering and farm structures

General articles on agricultural engineering: associations, history, education, biographies, etc.

Structures: design and construction of structures such as farmhouses, utility buildings, including barns, silos, sheds, greenhouses, plastic structures, and others. Foundations, maintenance. Farm beautification. Drainage and irrigation structures. Water supply systems. Sewage and waste disposal systems. Walls and fences. Structural equipment, materials, and supplies.

Excavation and earth moving equipment, hoisting and conveying equipment.

Safety engineering: Fire-fighting equipment, fire-detection equipment, accident prevention, safety devices.

For forest fire-fighting equipment see 3505.

Power sources: electrical, electronic, sonic, solar, gas, water, wind, thermal, mechanical. Capacitors, batteries, nuclear power conversion. Rural electrification, public utilities, heating, lighting, power plants, telephones. Electrical and electronic engineering.

For use of wind machines in frost protection see 4520.

5510 Farm equipment

Machines and machine elements for field preparation, planting, fertilizing, cultivation, harvesting, loading, transportation, related handling and storage, including container and packaging equipment and other processing equipment used on the farm. Pest and disease control equipment, including sprayers and dusters. Livestock and dairy equipment. Special purpose equipment, tractors, accessories, etc. Mechanical engineering. Drainage and irrigation equipment.

Includes repair and maintenance.

For logging equipment see 3520.

For beekeeping equipment see 5015.

For equipment for processing farm products see 2005–2035.

For laboratory or research equipment see the specific subject category.

SOIL AND WATER RESOURCE MANAGEMENT

6005 Soil Science

Soil physics: soil mechanics; physical properties of soil, structure, porosity, moisture, aeration, temperature, etc.

Soil chemistry and mineralogy: electrolytes, clay minerals, base and anion exchange, chemical composition. Fixation of phosphorus, potassium, etc. Nitrogen, sulfur, and other elements from precipitation; chelates, frits. Leaching, soil testing. Saline soils, salts in soils, hydrogen-ion concentration.

Soil biology; soil fauna, including bacteria, fungi, protozoa, and nematodes. Microbiological activity; decomposition of organic matter. Enzymes, nitrification, denitrification, ammonification, nitrogen fixation, legume inoculation, nitrogen fixing bacteria: *Rhizobium*, *Azotobacter*, etc. when not related to plant physiology. Soil-plant-animal relationships.

Soil classification and surveys: genesis, formation, intrinsic properties. Systematic grouping of soils into categories by constituents of types. Soil surveys and mapping.

Includes forest soils.

For soil-borne pathogens see the specific disease category.

For pesticides in soils see 4560.

6010 Soil improvement materials

Organic and inorganic materials applied to soil and water to provide plant nutrients and to increase growth and yields. Chemical fertilizers: nitrogen, phosphorus, and potassium; macronutrient and micronutrient element materials. Bacterial fertilizers, including azotobacterin and phosphorobacterin. Manures and composts. Soil conditioners and amendments; green manures and cover crops. Industrial waste as fertilizers, sewage, sludge. Foliar diagnosis and placement methods for fertilizers.

Fertilizer industry, technology, statistics, prices and trade.

Includes forest fertilizing.

Includes tables of yields.

Sewage or waste water irrigation goes here or in 6020 according to main use.

For effect of fertilizer on plant growth and development see 4030-4045.

For mulches see 6015.

6015 Soil resources and management

Soil as a natural and an economic resource. Preservation of soil resources and conservation in general; maintenance and improvement of fertility and productivity of soils. Protective measures and technical practices designed to prevent or reduce soil erosion and soil depletion; land reclamation, terracing, contouring, polders, tillage, fallowing, mulching, dry farming.

For soil pollution see 6505.

6020 Water resources and management

Hydrology as related to agriculture. Water supply, conservation, quality, and management practices. Snow surveys. Design and methods of drainage, irrigation, desalinization, flood control.

Includes forest irrigation and drainage.

For drainage, irrigation, and flood control equipment see 5510.

For drainage, irrigation and flood control structures see 5505.

For water pollution see 6505.

GENERAL NATURAL RESOURCES AND ENVIRONMENTAL POLLUTION

6505 General natural resources and environmental pollution

General natural resources, too broad for 6015 or 6020. General recreational use.

Animal wastes, sediment, plant nutrients, inorganic salts and minerals, forest and crop residues, agricultural processing wastes, smokes, dusts, other air pollutants, eutrophication.

All pollution goes here-- not in 6015 or 6020.

For utilization or recycling of agricultural wastes or residues see specific subject category or double index.

For pesticides pollution see 4560 or double index.

AUXILIARY CATEGORIES

7005 Life sciences

7505 Physical sciences and mathematics

8005 Chemistry

8505 Technology

9005 Economics and administration

9505 Social sciences and humanities

9705 Information science

1970-1971 Category Codes

05	Agriculture (general)
10	Agricultural economics and rural sociology
15	Agricultural products (economics and technology)
20	Animal sciences
25	Chemistry
30	Engineering
35	Entomology
40	Food, human nutrition, and home economics
45	Forestry
50	Life sciences (general)
55	Natural resources (general)
60	Pesticides (general)
65	Physical sciences (general)
70	Plant science
75	Social science (general)
80	Soils and fertilizers
85	Water resources
90	Reference materials

E. GEOGRAPHICS USED IN INDEXING PRACTICES*

* added 1975

† form of entry changed

Abu Dhabi <i>use</i> United Arab Emirates	British Honduras
Abyssinia <i>use</i> Ethiopia	British Isles
Aegean Island <i>use</i> Greece	British North Borneo <i>use</i> Malaysia
Afghanistan	British Solomon Islands *
Africa *	British Somaliland <i>use</i> Somali Republic
Alabama	Brunei † (was Borneo)
Alaska	Bulgaria
Albania	Burma
Algeria	Burundi
America *	California
American Samoa	Cambodia
Andorra *	Cameroon † (was Cameroun)
Angola	Canada
Antarctica *	Canary Islands
Arctic Regions	Cape Verde Islands
Argentina † (was Argentine Republic)	Caroline Islands
Arizona	Cayman Brac <i>use</i> Cayman Islands
Arkansas	Cayman Islands
Aruba <i>use</i> Netherlands Antilles	Celebes <i>use</i> Indonesia
Asia *	Central African Republic
Australia	Central America
Austria	Ceylon <i>use</i> Sri Lanka †
Azores *	Chad
Bahamas *	Chile
Bahrain	China
Balearic Islands *	Colombia
Balkans *	Colorado
Bangladesh	Comoro Islands
Barbados *	Congo (Brazzaville) <i>use</i> Congo
Barro Colorado Island	Congo (Kinshasa) <i>use</i> Zaire †
Basutoland <i>use</i> Lesotho	Connecticut
Bechuanaland <i>use</i> Botswana	Cook Islands
Belgian Congo <i>use</i> Zaire	Costa Rica
Belgium	Cuba
Belize <i>use</i> British Honduras	Cyprus
Bermuda *	Czechoslovakia † (was Czechoslovak Republic)
Bhutan	Dahomey
Bismark Archipelago	Delaware
Bolivia	Denmark
Borneo	District of Columbia *
Botswana	Dominican Republic
Brazil	Dutch Guiana <i>use</i> Surinam
British Guiana <i>use</i> Guyana	East Africa
	East Africa Protectorate <i>use</i> Kenya

*Not synonymous with geographics used for monographs.

East Indies *use* Indonesia
 East Pakistan *use* Bangladesh
 Ecuador
 Egypt *use* United Arab Republic
 Eire *use* Ireland
 El Salvador *
 England *
 Equatorial Guinea *
 Ethiopia
 Europe *
 Falkland Islands
 Far East
 Fernando Po *use* Equatorial Guinea
 Fiji
 Finland
 Florida
 France
 French Guiana *
 French Polynesia
 French Sudan *use* Mali
 French Territory of Afars and Issas *
 French Togoland *use* Togo
 Frisian Islands
 Gabon
 Galapagos Islands *
 Gambia
 Georgia
 German East Africa *use* Tanzania
 Germany (Democratic Republic)
 Germany (Federal Republic)
 Ghana
 Gold Coast *use* Ghana
 Grand Cayman Island *use* Cayman Islands
 Great Britain
 Greece
 Greenland
 Guam *
 Guatemala
 Guinea
 Guyana
 Haiti
 Hawaii
 Honduras
 Hong Kong
 Hungary
 Iceland
 Idaha
 Illinois

India
 Indiana
 Indonesia
 Iowa
 Iran
 Iraq
 Ireland *
 Ireland, Northern *use* Northern Ireland
 Israel
 Italian Somaliland *use* Somali Republic
 Italy
 Ivory Coast
 Jamaica
 Japan
 Java *use* Indonesia
 Jordan
 Kansas
 Kentucky
 Kenya
 Khmer *use* Cambodia *
 Korea (North) *
 Korea (South) † (was Korea)
 Kurile Islands
 Kuwait
 Laos
 Latin America
 Lebanon
 Lesotho
 Liberia
 Libyan Arab Republic
 Liechtenstein *
 Little Cayman *use* Cayman Islands
 Louisiana
 Luxembourg
 Madagascar *use* Malagasy Republic
 Madeira
 Maine
 Malagasy Republic
 Malawi
 Malaya *use* Malaysia
 Malaysia
 Mali
 Malta
 Mariana Islands *
 Marshall Islands
 Maryland
 Mascarene Islands
 Massachusetts
 Mauritania *

Mauritius
 Mediterranean Region
 Melanesia *
 Mexico
 Michigan
 Micronesia *
 Minnesota
 Mississippi
 Missouri
 Monaco *
 Mongolia † (was Mongolian People's
 Republic)
 Montana
 Morocco
 Mozambique
 Muscat and Oman *use* Oman *
 Nebraska
 Nepal
 Netherlands
 Netherlands Antilles
 Netherlands East Indies *use* Indonesia
 Nevada
 New Caledonia *
 New Guinea *use* Papua and . . . *
 New Hampshire
 New Hebrides *
 New Jersey
 New Mexico
 New York
 New Zealand
 Nicaragua
 Niger *
 Nigeria
 Niue Island *use* New Zealand
 North Africa
 North America *
 North Borneo *use* Malaysia
 North Carolina
 North Dakota
 Northern Ireland
 Northern Rhodesia *use* Zambia
 Norway
 Nyasaland *use* Malawi
 Oceania *
 Ohio
 Oklahoma
 Oman *
 Oregon
 Pakistan

Palestine *use* Israel
 Panama
 Panama Canal Zone
 Papua and New Guinea *
 Paraguay
 Pennsylvania
 People's Republic of Mongolia *use*
 Mongolia
 Persia *use* Iran
 Peru
 Philippine Islands
 Poland
 Polynesia
 Portugal
 Portuguese Guinea *
 Puerto Rico
 Qatar *
 Reunion *
 Rhode Island
 Rhodesia
 Rio Muni *use* Equatorial Guinea
 Romania
 Ruanda--Urundi *use* Burundi
 Rumania *use* Romania
 Rwanda
 Ryukyu Islands
 Saint Helena
 Sakhalin Island
 Samoa, American *use* American Samoa
 Samoa Islands
 Samoa, Western *use* Western Samoa
 Sao Tome and Principe *
 Sardinia *use* Italy
 Saudi Arabia
 Scandinavia *
 Scotland
 Senegal
 Seychelles *
 Siam *use* Thailand
 Sicily *use* Italy
 Sierra Leone
 Sikkim *
 Singapore
 Solomon Islands *use* British . . .
 Somali Republic
 Somalia *use* Somali Republic
 South Africa
 South America *
 South Carolina

South Dakota
 South West Africa
 Southeast Asia
 Soviet Union *use* USSR
 Spain
 Spanish Guinea *use* Equatorial Guinea
 Sri Lanka † (was Ceylon)
 Straits Settlements *use* Singapore
 Sudan
 Sulawesi *use* Indonesia
 Sumatra *use* Indonesia
 Surinam
 Svalbard *use* Norway
 Swaziland
 Sweden
 Switzerland
 Syria
 Tahiti *
 Taiwan
 Tanganyika *use* Tanzania
 Tanzania
 Tennessee
 Texas
 Thailand
 Tibet *use* China
 Timor
 Tobago *use* Trinidad and Tobago
 Togo
 Tonga
 Transjordan *use* Jordan
 Trinidad *use* Trinidad and Tobago
 Trinidad and Tobago
 Tunisia
 Turkey
 Uganda
 Union of South Africa *use* South Africa
 United Arab Emirates
 United Arab Republic
 United States
 Upper Volta
 Uruguay
 USSR
 Utah
 Venezuela
 Vermont
 Vietnam (North)
 Vietnam (South) † (was Vietnam)
 Virgin Islands *
 Virginia
 Wales

Washington *
 West Africa
 West Indies *
 West Irian *use* Indonesia
 West Pakistan *use* Pakistan
 West Virginia
 Western Samoa
 Wisconsin
 Wyoming
 Yemen (People's Democratic Republic)
 Yemen Arab Republic
 Yugoslavia
 Zaire *
 Zambia
 Zanzibar *use* Tanzania

F. LANGUAGE DESCRIPTORS

LANGUAGE ABBREVIATIONS MARC Standard (Example: LA=AFR)

(Afr)	Afrikaans [AF] **	(Jpn)	Japanese * [JA]
(Alb)	Albanian [AB]	(Kor)	Korean [KO]
(Arm)	Armenian [AR]	(Lat)	Latin [KZ]
(Aze)	Azerbaijani [AZ]	(Lav)	Latvian [LA]
(Bel)	Belorussian [BE]	(Lit)	Lithuanian [LI]
(Bul)	Bulgarian [BU]	(Mac)	Macedonian [LU]
(Bur)	Burmese [BV]	(Nor)	Norwegian [NO]
(Chi)	Chinese [CH]	(Pol)	Polish [PO]
(Cro)	Croatian [CR] ***	(Por)	Portuguese [PT]
(Cze)	Czech [CZ]	(Rum)	Rumanian [RO]
(Dan)	Danish [DA]	(Rus)	Russian [RS]
(Dut)	Dutch [NE]	(Scc)	Serbo-Croatian (Cyrillic)
(Est)	Estonian [ES]	(Scr)	Serbo-Croatian (Roman)
(Fin)	Finnish [FI]	(Ser)	Serbian [SE] ***
(Fre)	French [FR]	(Slo)	Slovak [SL]
(Geo)	Georgian [GR]	(Slv)	Slovenian [SN]
(Ger)	German [GE]	(Spa)	Spanish [SP]
(Gre)	Greek [GK]	(Swe)	Swedish [SS]
(Heb)	Hebrew [HE]	(Tha)	Thai [TH]
(Hun)	Hungarian [HU]	(Tur)	Turkish [TK]
(Ice)	Icelandic [IC]	(Ukr)	Ukrainian [UK]
(Ind)	Indonesian [ID]	(Mul)	Multilingual
(Ita)	Italian [IT]		

* JAP changed to JPN 4/15/74

** BRS two-digit searching code

*** Changed at end of 1976; see Scc and Scr

NOTES

SECTION III.

DIALOG SEARCHING

A. SYSTEM PROTOCOLS

SYSTEM CUES

After he has successfully logged in, either through direct dial, Telex, or one of the data communication networks, the user enters two-way communication with the DIALOG search program. Depending on the type of terminal he is operating, the user will receive one of two cues that it is his turn to enter information. For most terminals the user's cue is a question mark (?) on the left side of the terminal's page or display screen. A few display terminals will cue the user by positioning the cursor after ENTER ___. Until one of these cues is given, the system cannot accept anything from the searcher.

MESSAGES TO THE SYSTEM

Once the input cue is given, the user can begin his search. The format for user input in the DIALOG system must follow the pattern:

Command name or symbol + Content of command

For instance, the command SELECT CHOLERA instructs the DIALOG program to find all citations containing the term CHOLERA and tag them with a unique set number for future reference. Once the command has been typed, it is sent to the computer by striking the CARRIAGE RETURN, INT, or SEND key (depending on the terminal being used).

```
?SELECT CHOLERA [carriage return]
3      378      CHOLERA (system response)
```

The computer responds with a three-part message as shown above, consisting of the set number (3), the number of citations in the set (378), and a description of the term or terms producing the set (CHOLERA). A complete explanation of the DIALOG commands can be found in section III-C.

When entering commands in DIALOG, one can choose to put a space between words or to type the command without spacing. Thus, both SELECT CHOLERA and SELECTCHOLERA are acceptable forms for entering a command. Generally speaking, in the DIALOG system when a user has doubts about whether to space, it is advisable *not* to space.

Most DIALOG commands have abbreviations and/or symbolic notations. These shortened forms may be used at all times. For instance, COMBINE 1 AND 2, C1AND2, and \$1*2 are all equally acceptable commands.

DIALOG allows the user to enter truncated versions of search terms. The format for entering truncated terms is:

SELECT + Truncated portion of search term + ?

Thus, `SELECT ECONOMIC?` will retrieve all citations beginning with the letters ECONOMIC-economic, economical, economics, etc. The program will select up to 800 terms from a truncation command: if more than 800 terms are found beginning with the specified letters, the program will respond with the message, `> 800 TERMS; RESPECIFY`. The user must then specify more letters in the initial command or use the `EXPAND` command to see a display of possible search terms. Truncation may also be used with formatted fields. For example, to search all authors whose last name is Hopkins, the command `SELECT AU=HOPKINS,?` can be used.

The question mark can also be used to perform other types of truncation as well. The question mark placed within a search term substitutes for single characters. Thus, `SELECT ORGANI?ATION` will retrieve both `ORGANIZATION` and `ORGANISATION`. Substitution of a single character or limited number of characters at the end of a search term is accomplished by adding `? ?` (i.e., question mark-space-question mark) to the stem. `SELECT COW? ?` will, for example, retrieve both the singular and plural forms of that word without also retrieving extraneous terms such as `cowpeas` and `cowbirds`.

The truncation function cannot, however, be used in conjunction with the full text searching capability. For instance, it is not now possible to enter `SELECT GROWTH(W)REGULATOR?` to retrieve all items containing the phrases `Growth Regulator` and `Growth Regulators`. In order to retrieve both possibilities the exact forms of these search terms must be `SELECTed`. Nor can end-of-word truncation be used when any of the suffix field designators (`TI`, `AB`, `CS`, `DE`) are specified in a command.

More than one command can be entered at one time by separating individual commands with semicolons. With practice, several related functions can be commanded by the user with one entry; for example, one may enter:

```
?SELECT TERM A;SELECT TERM B;COMBINE 1AND2;TYPE 3/6/1-5
```

In this way the user gets down to the important task of reviewing citations in a much shorter time.

Several things need to be kept in mind, however, when using this technique. First, each part of the chain of commands must be a complete command statement; that is, the command function to be performed must be specified in each part of the chain. Second, no single command can be longer than 62 characters, although the string of commands itself can, in most cases, exceed one line. Chaining of commands is recommended only after the user feels confident in using the `DIALOG` system.

CORRECTING TYPOGRAPHICAL ERRORS

The user may discover an error in his input message before he has sent it to the computer. He can choose to wipe out the entire line and start over or he may wish to correct the input message and then send it to the computer.

To erase an entire line and get a new user cue, simply strike the ESC (escape) key and then depress the RETURN (INT, SEND) key. The print head will go back to the left margin and print a new user cue (?).

To correct errors letter-by-letter simply strike the backspace key for each letter that needs correcting, then retype the correct entry and send the message to the computer. The character correction key may differ with the terminal model; for instance, some terminals require the user to hold down the CONTROL key and then strike the H key until the print head has backed up to the error. Always be sure to check the operating instructions for the terminal you are using.

MESSAGES FROM THE SYSTEM

DIALOG's portion of the online communication consists of responses to a user's commands. These responses will be either the required functional responses (set descriptions, term expansions, etc.) or error messages. There are over thirty program error messages; full explanations of them will be found at the end of this section. Occasionally, the user will want to stop the program's response before it is finished. To interrupt program output, simply strike the BREAK key (do not hold the key down too long or the terminal may get disconnected from DIALOG). The system will stop typing and give a new user cue. BREAK can be used only to interrupt a system response; it cannot be used to erase a user's command once it has been sent to the computer.

B. SEARCHING SEQUENCE

As soon as the user has successfully logged in, the system will respond with a program greeting acknowledging LOGON, followed by the first user cue. During this period the user is, in most cases, connected to his default file—usually a low priced file used fairly frequently, e.g., AGRICOLA or NTIS.

The first order of business is to enter a full BEGIN or one of the shorter BEGIN commands and select a file for searching. Once a file has been selected, the user is ready to start searching by issuing EXPAND, SELECT, and COMBINE commands. Items from any of the searchable fields can be expanded in an alphabetical display and selected into sets; however, only terms in the primary inverted index (title, descriptor, corporate source, and abstract fields) can be entered without field designator prefixes. The command SELECT FORAGE, for instance, will result in the creation of a set of citations in which the term FORAGE appears in any of the four primary index fields. If the field to be searched is not the primary inverted index, a prefix retrieval code directing the computer to the desired field must be entered before the desired search term. For example, to get an alphabetic expansion of the personal author entries surrounding the name John Jones, the user must enter a command similar to the following:

```
EXPAND AU=JONES, J
```

A full list of retrieval codes can be found in section III-D.

Terms may be selected by E number from an EXPAND display, e.g., SELECT F6,E10-E13. Their terms may also be selected into sets directly, e.g., SELECT PEANUT or SELECT CC=1510.

As soon as all desired sets have been created, the user can then COMBINE them with the Boolean operators AND, OR, and NOT (see Section I-B). If there is a long list of sets that are to be combined with the same operator - most often OR - a good deal of time can be saved by entering the terms consecutively and then combining them in this manner: COMBINE 1-10/OR. This technique will work, however, only when the sets to be combined are in an uninterrupted sequence.

Complex set combinations can be made through the use of parentheses to indicate the intended logic. Thus, if the user were interested in articles on diseases of calves, he might use the following logic:

? # CC=3005; # CC=3010; # CC=3015; # CC=3020;4/OR

1 6113 CC=3005
2 20689 CC=3010
3 5210 CC=3015
4 2645 CC=3020
5 34628 1-4/OR

? # CALF; # CALVES

6 1446 CALF
7 3341 CALVES

? # DT=MONOGRAPH

8 78350 DT=MONOGRAPH

?\$(5AND(6OR7)NOT8

9 1353 (5AND(6OR7))NOT8

?T9/6/1-2

9/6/1

981239

20 M57 ID # - 75-9060206

PROPHYLACTIC VACCINATION OF CALVES FOR CONTROLLING LUNGWORMS
IN CATTLE

9/6/2

981146

41.8 V6426 ID # - 75-9060013

SENSITIVITY OF LIVESTOCK TO NITROFURAN PREPARATIONS. CALVES,
PIGLETS, CHICKENS.

Once terms have been selected into sets, the citations in any set can be seen by entering the command to DISPLAY or to TYPE that set in a particular format. If no format is specified, the system defaults to Format 2 - author, title, source, descriptors. In reviewing a few sample citations, the user may discover additional search terms that he can add to the search strategy to increase the recall, or he may discover some particular aspect being recalled that he needs to try to eliminate from the output, thereby increasing the precision of his search.

To get citations from any set printed out offline, the PRINT command is used. When ordering offline prints, the user may also specify that the citations are to be sorted alphabetically or in sequence by fields such as author, title, or call number.

Once offline prints have been ordered, the user can continue his online work by entering new search terms and combinations, or start a new search with another BEGIN command. When he is finished, the user ends his online interaction by entering the command LOGOFF and then hanging up the telephone.

C. DIALOG COMMANDS

The DIALOG search program employs 23 command functions. Each entry the user wishes to make must be preceded by the name of the desired function, its abbreviation, or its symbol. The function and use of the various commands are summarized below.

DIALOG COMMANDS SUMMARY		
COMMANDS, ABBREVIATIONS, AND SYMBOLS	FUNCTION	SAMPLE ENTRIES
BEGIN B !	Clears out previous search history and starts user back at the search heading. Prepares printout for title page; does not change mailing address.	BEGIN B !
BEGIN BYPASS !B	Clears out previous search history and starts user at Set 1 in his default file without going through the search heading.	BEGIN BYPASS !B
BEGIN <u>n</u> ! <u>n</u> <u>Bn</u> .COST	Clears previous search history and starts user at Set 1 in file specified Prints out information on elapsed time and estimated charges since the last BEGIN command was entered.	BEGIN10 !10 B10 .COST
COMBINE C \$	Joins the items in previously created sets with the Boolean logical operators.	COMBINE 1AND2AND3 C7OR8 \$(1OR2)AND(3OR4)
DISPLAY D %	Causes items in a specified set to be displayed on the screen of a CRT terminal.	DISPLAY D3/2/1-10 %4/5/1
DISPLAY SETS DS (a	Reiterates the set history of all sets created since the last BEGIN command, or a specified range of sets.	DISPLAY SETS DS28-35 (a

DIALOG COMMANDS SUMMARY CONT'D.

COMMANDS, ABBREVIATIONS, AND SYMBOLS

FUNCTION

SAMPLE ENTRIES

END =	Terminates a search and reports the time spent on the search and estimated costs.	END =
END/SAVE =/SAVE	Allows user to store away the search terms and logic from a search for use at a later time.	END/SAVE =/SAVE
END/SDI =/SDI	Allows user to store a search to be run each time the data base is updated.	END/SDI =/SDI
.EXECUTE	Performs search steps in a stored search that has been recalled. Provides access to contents of final set only.	.EXECUTE .EXECUTEECG4
EXPAND E “	Displays a list of index terms alphabetically adjacent to a specified term.	EXPAND CONSUMER E NO=HD9205 “AU=JONES, H J
EXPLAIN ?	Provides online explanation of system commands, procedures, news and updates. It is used only in symbolic form.	?DISPLAY SETS ?NEWS ?UPDATE
.FILE	Allows user to switch to any data base he is authorized to search. Does not clear prior search history.	.FILE10 .FILE6 .
KEEP K (Stores specific items from any set in a special reserve set (Set 99) for later use.	KEEP 5 K7/8-15 (15/6
LIMIT L)	Allows user to restrict items in a set to English to foreign language only. Items may be limited to a range of Lockheed ID numbers as well.	LIMIT 15/MAJ L13/MIN)25/800000-1999999
LOGOFF	Terminates search, records time spent on that search, stops connect-time accounting, and disconnects user from DIALOG.	LOGOFF
MESSAGE M]	Allows user to transmit a message to any other terminal that is operating at that time.	MESSAGE9003/HELP! M9003/WHAT'S WRONG?]9003/ARE US UP ON SAT?

DIALOG COMMANDS SUMMARY CONT'D.

COMMANDS, ABBREVIATIONS, AND SYMBOLS

FUNCTION

SAMPLE ENTRIES

PAGE P Ø	Allows user to see additional segments of system output that is longer than 25 lines.	PAGE P P-
PRINT PR &	Stores request for offline printing tasks. Sorting of output also possible with this command.	PRINT5 PR6/2/1-74 &25/5/1-23/AU, TI
PRINT- PR- &-	Deletes the last offline print command.	PRINT- PR- &-
.RECALL	Displays the logic of a stored search completed in an earlier session.	.RECALL4SQ
.RELEASE	Allows user to erase saved search after it is no longer needed.	.RELEASE4SQ
SELECT S #	Chooses and groups search terms into sequentially numbered sets (up to 98).	SELECT PIGS S CC=3015 # SPLAY(W)LEG
TYPE T ,	Allows user to get online display from any set on a hard copy terminal.	TYPE5/2/1-3 T13/6 '84/5/15-18

BEGIN B !

This command clears the system of the previous search history and starts the user out at the search heading questionnaire. The search heading questionnaire allows the user to identify the requestor of the search, to give an address so the results may be forwarded to the correct location by the searcher, and to select the file he wishes to search from an updated display of available files.

Full BEGIN does not change the mailing address to which search results will be sent. All offline prints will be mailed to the address specified at the time the user's Lockheed contract was negotiated.

BEGIN BYPASS !B

BEGIN n Bn !n

The search questionnaire generated by a full BEGIN can be circumvented in two ways: (1) by adding BYPASS or B after the BEGIN command or (2) by adding the number of the file to be searched after the BEGIN command. BEGIN BYPASS or !B starts the user out at the beginning of the set history and assumes the user's default file as the data base to be searched. BEGINn (n=file number), Bn or !n allow the user to start out at the beginning of the set history plus

select the file to be searched; thus BEGIN10, B10, or !10 will start the user on a new set history in the AGRICOLA file, which is file number 10. Each form of the BEGIN command not only erases the previous search history but also generates an end message consisting of a summary of connect time and offline prints plus an estimate of charges up to that point.

COMBINE C \$

The COMBINE command allows the user to join two or more previously created sets with one or more of the Boolean operators (see Section I-B). The result of a COMBINE statement is a new set containing the results of the specified combination. Each of the following is an acceptable COMBINE statement: COMBINE1 OR 2; C(7OR8OR9)AND(15OR16);C1*5. As illustrated by the last example, each Boolean operator has a symbolic representation in DIALOG: AND(*), OR(+), NOT(-); the searcher is free to use whatever form of the operators he chooses and can, in fact, combine forms. Thus the command C1*2NOT3 is perfectly acceptable to the DIALOG program.

DISPLAY D %

(Used with CRT display terminal.) Entering the DISPLAY command with a set number will cause the first item (the citation with the highest accession number in the set) to be displayed on the terminal's screen. To continue viewing items in the set, the user depresses the PAGE key for each subsequent citation. Unless the format is specified, the program will display citations in format 2.

DISPLAY SETS DS @

Entry of this command during a search produces a reiteration of the set history up to that point. This is particularly useful in lengthy searches where the record of previously created sets has either disappeared from the display screen or has gotten buried in several feet of terminal paper.

The DISPLAY SETS command when entered alone will produce a display of the set history beginning with Set 1. The history of a specific set or range of sets can be displayed by adding to the command the appropriate set numbers. Thus, DS31-40 will result in a display of the set history for sets 31 through 40 inclusive.

Those using the Telenet communications network would be aware that use of the command in its symbolic form (@) will result in a disconnection from DIALOG. In order to avoid this inconvenience, either of the other forms of the command should be used-- i.e., fully spelled out or DS.

END =

An END command terminates a particular search and reports several search statistics: Date, Clock Time, User Number, Elapsed Time, File Searched, Number of Descriptors Used, Number of Citations Requested, and Estimated Costs. END does not reset the search history or stop the clock for accounting purposes; it does, however, reset the elapsed time counter to zero. A typical END message is illustrated below:

\$ 6.98	0.279 HRS FILE10* 10 Descriptors
\$ 1.40	TELENET
\$ 8.38	ESTIMATED TOTAL COST

An END message is automatically generated by certain other DIALOG commands, namely BEGIN, .FILE, END, AND LOGOFF. Thus, if a user enters a .FILE command, he will first see printed the END response indicating that that portion of his search is completed, and then he will receive the response indicating that the program has switched him to a new file.

END/SAVE =/SAVE

This command performs all the functions of the regular END command--terminates a search and reports statistics on it--and it stores the search terms and the logic used during that search for use at a later time. After this command is entered, the computer responds with a unique serial number to be used in recalling the search specifications in the future.

This serial number is stored specifically for the password in use at the time a search is saved. It can be accessed only with that password. At the present time there is no way for a searcher to determine online what serial numbers have been assigned to a particular password, so he should be careful to record the serial numbers as he saves searches. Lockheed does not charge for saving search strategies provided that they are purged from the system before the end of the month. A charge of 10 cents per line will be charged for each search still in the system past the end of any month.

END/SDI =/SDI

This command performs all normal end functions and also stores the search strategy as a profile for a monthly selective dissemination of information (SDI) service. As with END/SAVE, the computer responds with a serial number that should be recorded for future reference. As Lockheed adds update tapes to the data base, each stored profile will be run; any hits will be printed and mailed to the user automatically. The SDI service will continue until the profile is erased with a .RELEASE command. This is a specially priced service.

.EXECUTE

This command instructs the DIALOG program to perform the steps in a stored search. When the user enters the command, the program starts at line one, performs all steps in order, and reports the results of the LAST line of the stored search as the next set number. See Section III-E for further explanation of Search Save techniques.

EXPAND E "

The EXPAND command is used to view an alphabetic display of a portion of the AGRICOLA searchable index. This display allows the user to check the spelling of search terms, to see variant forms of the same base word, and to see terms that might be relevant to

his topic which may not have occurred to him originally. Misspellings may also be picked up, such as "ducklin" in the example display. The EXPAND command plus the entry of a term produces an initial display of up to 20 terms labelled E1 through E20. The term entered in the command is usually the one labelled E6. Items up to number E51 may be viewed and selected as a result of one EXPAND command. The user must select the terms from that list of 51 entries. The expansion can continue beyond the 51st item, but the later terms will be renumbered beginning with E1 again.

EXPAND DUCK produces the following display:

REF	INDEX-TERM	TYPE ITEMS RT
E1	DUCHONONOV1- - - - -	1
E2	DUCHTEN- - - - -	1
E3	DUCHY- - - - -	20
E4	DUCIN- - - - -	1
E5	DUCITOL- - - - -	1
E6	-DUCK- - - - -	480
E7	DUCK PLAGUE- - - - -	1
E8	DUCK PLAGUE VIRUS- - - - -	2
E9	DUCK SHOOTING- - - - -	1
E10	DUCK'S- - - - -	6
E11	DUCKE- - - - -	15
E12	DUCKE1- - - - -	3
E13	DUCKE1N- - - - -	1
E14	DUCKEOLA- - - - -	1
E15	DUCKER- - - - -	2
E16	DUCKETT- - - - -	2
E17	DUCKLIN- - - - -	1
E18	DUCKLING- - - - -	30
E19	DUCKLINGS- - - - -	177
E20	DUCKLINS- - - - -	1
		-MORE-

.FILE

The entry .FILE followed by the number of an available data base accomplishes two things: it automatically generates an END which records search statistics for the previous search and it switches the user into the file he has specified. Thus, if the user were searching in File 1 (ERIC) on agricultural education and he decided to switch to the AGRICOLA data base, he would enter .FILE10. The program would record the statistics for the ERIC search and then switch to the AGRICOLA file. The set history is not reset to Set 1; so if the user switched files after Set 10, the next set he would create after switching files would be Set 11. In order to switch files plus reset the set history to Set 1, the user should enter a BEGIN followed by a file number, e.g., BEGIN3.

KEEP K (

KEEP allows the user to pick out of a particular set only those citations which are relevant to his needs. This is particularly useful for searchers who are previewing several citations on a

display screen and want to print offline or type only a few highly relevant items. The format for entering KEEP commands is as follows: KEEP set #/item # or item # range. For example, KEEP5/3-6 will keep items 3 through 6 of Set 5; KEEP6 would add the entire contents of Set 6 to those four items already retained from Set 5. All kept items go into Set 99, which can be used like all other sets; the user, however, must remember that he has stored items in that set because its use is never noted when the set history is displayed.

LIMIT L)

The LIMIT command allows the user to modify his search by restricting citations to those in English or to those in foreign languages. To limit a set to English citations enter: LIMIT set # / MAJ (for MAJOR language) - e.g., LIMIT5/MAJ. This command will limit the set to English citations only; articles both in English and a foreign language will be excluded. To limit a set to foreign language citations only, enter: LIMIT set # /MIN (for MINOR languages) - e.g.)5/MIN.

LIMIT can also be used to restrict search output to a specified range of DIALOG accession numbers. LIMIT3/850001-1999999 will, for example, restrict the results of Set 3 to those items with accession numbers greater than 850000, an effective way of restricting search results to only the more recent references.

If the user knows ahead of time that all references are to be limited to a given range of accession numbers, he can specify that fact at the beginning of his search by entering LIMITALL/ followed by the desired range of numbers, e.g., LIMITALL/850001-1999999. This feature is particularly useful when updating previously completed searches. To cancel the LIMITALL specifications and search the entire AGRICOLA file, the user enters LIMITALL/ALL. From that point on then the postings received from search statements will be for the entire data base.

MESSAGE M]

The MESSAGE command allows the user to communicate online with another terminal operating at the same time. Format for this command is: MESSAGE + Terminal number/ Content of message, e.g. MESSAGE9003/HELP! The number 9003 signifies that the Lockheed terminal in the Palo Alto Computer Facility is to receive the message. The content of any single message can be no longer than one line. In most cases, however, the most effective method of communicating with Lockheed is to use the toll free telephone numbers to the DIALOG Customer Services staff.

PAGE P ↵

Unless it is instructed to do so, the DIALOG program will not display at one time more lines than can fit on a CRT screen. The program signals that there is more to be seen with the word MORE at the bottom of the display. If the user desires to see more of the display, he simply enters the PAGE command and the next portion will appear. To see again a portion of the display that has rolled off the screen, the user enters PAGE- (i.e., PAGE MINUS), and the program will display again the previous portion of the output.

PRINT PR &

After the user is satisfied that he has refined his search sufficiently during the online session, he may wish to have citations printed offline and mailed to him. This task is accomplished by entering the command PRINT plus the number of the set to be printed, the number of the format in which they are to be printed, and the number range of the citations to be printed. Thus, the command PRINT10/5/1-174 means that the user wants citations from Set 10 to be printed offline in the fullest format (5) and items 1 through 174 in Set 10 are the ones to be printed. Examples of each of the available formats are given below:

FORMAT 1 (Lockheed accession numbers only)

959930 938668 918282 918279 917516

FORMAT 2 (Author, title, source, call number, descriptors)

959930
389.8 AM34 ID # - 75-9429064
VITAMIN E ADEQUACY OF VEGETABLE OILS
BIERI, J G; EVARTS, R POUKKA
J AM DIET ASSOC 66 (2): 134-139 FEB1975
DESCRIPTORS- VITAMIN E, VEGETABLE OILS, UNSATURATED FATS, CORN
OIL, SAFFLOWER OIL, SOYBEAN OIL, HYDROGENATED FATS, NUTRIENT
REQUIREMENTS

FORMAT 3 (Bibliographic citation)

959930
VITAMIN E ADEQUACY OF VEGETABLE OILS
BIERI, J G; EVARTS, R POUKKA
J AM DIET ASSOC 66 (2): 134-139 FEB1975

FORMATS 4*,5,7* (Full record, formatted)

959930
389.8 AM34 ID # - 75-9429064
VITAMIN E ADEQUACY OF VEGETABLE OILS
BIERI, J G; EVARTS, R POUKKA
J AM DIET ASSOC 66 (2): 134-139 FEB1975
DESCRIPTORS- VITAMIN E, VEGETABLE OILS, UNSATURATED FATS, CORN
OIL, SAFFLOWER OIL, SOYBEAN OIL, HYDROGENATED FATS, NUTRIENT
REQUIREMENTS
CAT CODE- 1510
SEARCH- 19750200
DOC TYPE- ARTICLE LOCATION- FNC

EXTRACT: IN THIS STUDY, YOUNG MALE RATS WERE FED DIETS CONTAINING 20 PERCENT FAT IN THE FORM OF SOYBEAN, CORN, OR SAFFLOWER OIL OR HYDROGENATED SHORTENING, AND THEIR VITAMIN E STATUS WAS ASSESSED FOR TWENTY-SEVEN WEEKS. ON THE BASIS OF GROWTH RATE, RED CELL HEMOLYSIS, PLASMA CREATIN PHOSPHOKINASE ACTIVITY AND TESTICULAR DEVELOPMENT, SOYBEAN AND CORN OILS AND SHORTENING PROVIDED ADEQUATE VITAMIN E. WITH SAFFLOWER OIL, THERE WAS SLIGHT RED CELL HEMOLYSIS. WHEN TOCOPHEROLS IN CORN OIL WERE REDUCED BY HALF, VITAMIN E STATUS STILL APPEARED NORMAL.

(*Formats 4 and 7 will differ from format 5 in other data bases.)

FORMAT 6 (Title and call number)

959930

389.8 AM 34 ID NO.- 75-9429064

VITAMIN E ADEQUACY OF VEGETABLE OILS

There is also a Format 0 (zero) which contains the unit record information in a form tagged for use by technicians who must input information or edit records. It will be of little use to the typical AGRICOLA searcher.

If the user does not specify the format for the offline prints, the computer will print them in Format 2. If the item range is not specified, only 50 will be printed; additional print commands must then be entered to get the remaining citations printed.

The PRINT command also contains a SORT option that the user may choose to exercise. Normally, the program will print citations in reverse chronological order; that is, the last citation added to the AGRICOLA file in a given subject will be the first printed out. To get citations printed out in alphabetical order by author and title, for example, the user must add this specification to his print command:

PRINT10/5/I-174/AU,A/TI,A

The DIALOG program interprets such a command in this fashion: Print Set 10 in format 5, 174 items, arranged by first author in ascending (i.e., A to Z) order and by title in ascending order under each author entry. Citations can be sorted by other unit record categories as well--by call number, for example.

PRINT- PR- &-

Occasionally the user may make an error in requesting offline prints. He can cancel a previously entered print command under the following conditions;

- (1) The PRINT- must be entered before any command that stores printing instructions is issued; that is, before .FILE, BEGIN, END, or LOGOFF.

(2) PRINT- does not allow the user to specify which PRINT command is to be deleted. It erases printing instructions only in reverse order from that in which they were given. Thus, if the user had entered two print commands during a search and then discovered an error in the first command, he would have to enter PRINT- twice in order to get the incorrect command deleted. Both sets of printing instructions would then have to be reentered correctly.

.RECALL

As soon as the user has no more use for a particular stored search, he should delete it from the computer's storage. To do this he enters the .RELEASE command plus the serial number for that search. Since .RELEASE is a nonreversible command, great care should be taken in releasing stored searches. In order to provide the user a measure of protection against his accidentally erasing the wrong serial number, the DIALOG program requires that before any saved search can be released, it must first be recalled.

SELECT S #

The SELECT command plus any search term causes the citations containing that term to be put into a numbered set. Up to 98 sets may be created in one search. When a SELECT command is entered, the computer responds with a postings message consisting of the set number, the number of citations in that set and a description of the set (usually a reiteration of the search term). For instance, SELECT CORN produces the following display:

<u>SET</u>	<u>ITEMS</u>	<u>DESCRIPTION</u>
1	7142	CORN

Without specific instructions to do otherwise, the computer searches for the occurrence of the entered term in all of the following primary fields: Descriptor (/DE), Corporate Source (/CS), Title (/TI), and Abstract (/AB). To limit the primary fields searched, the user must add the appropriate suffix to the search term. To search for the term California occurring in titles only, one would enter SELECT CALIFORNIA/TI. Selecting terms from other searchable categories of the AGRICOLA record requires the addition of a prefix denoting which field is to be searched. For instance, to search for all citations indexed in the category for agricultural engineering, enter SELECT CC=5505.

Terms may also be selected by entering the SELECT command with the E number associated with terms in an EXPAND display. From the display generated by the command EXPAND DUCK discussed earlier, a command SELECT E6,E10,E18-E19 produces a set of 672 citations:

<u>SET</u>	<u>ITEMS</u>	<u>DESCRIPTION</u>
2	672	E6,E10,+18-E19 (E6: DUCK)

Until another EXPAND command is given, one can continue to SELECT terms from the EXPAND listing. For instance, one can make two more sets from the display:

```
? SELECT E6,E10
```

```
3      486      E6,E10
              (E6: DUCK)
```

```
? SELECT E18-E19
```

```
4      205      E18-E19
              (E6: DUCK)
```

Terms may be selected in truncated forms as well. The DIALOG program allows right-hand truncation of any searchable element in the AGRICOLA unit record by the addition of a question mark after the desired stem characters. Up to 800 terms will be searched with truncation of any stem; the user should be careful, therefore, in using this technique, or he may be very surprised in the results he obtains. For example, the user who enters SELECT BEHAVIO? will probably be safe since words beginning with that stem would most likely relate to behavior (behavior, behaviour, behaviours, etc.). The user who tried SELECT INSECT? expecting to get only the singular and plural forms of that word, would be surprised, however, by a large number of items on insecticides and insectivores in addition to those on insects. Consult Section III-A for more detail on truncation functions in DIALOG.

TYPE T

(Used most often with printing terminals.) Entering the TYPE command allows the user to have typed online citations from any set he has created. Format for the TYPE command is: TYPE Set # /Format #/Item # or Item # range--e.g. TYPE 3/2/1-10. As with the PRINT and DISPLAY commands, the TYPE command will produce citations in format 2 unless another format is specified. If an item number or range of item numbers is not specified, the computer will type only the first item (the citation with the highest accession number in the set). The user must then enter the TYPE command for each subsequent citation.

D. DIALOG RETRIEVAL CODES

The searchable elements of each AGRICOLA unit record are tagged by two-letter field designators or retrieval codes. These retrieval codes can be broken into two major categories:

1) Primary Inverted Index Designators (Suffix Codes) and 2) Formatted Field Designators (Prefix Codes).

The terms from the Primary Inverted Index may be searched with or without their field designators. If these terms are entered without field designators, all four of the categories in the Primary Inverted Index are searched, i.e., descriptors, title words, abstracts, and names from the corporate source field. For any term entered with one or more of the suffix codes attached, DIALOG will report only occurrences of that term in the field or fields specified. To illustrate, SELECT CALIFORNIA will create a set containing all citations in which the term CALIFORNIA appears in any of the Primary Inverted Index fields, but SELECT CALIFORNIA/CS will retrieve only citations in which the term occurs in the corporate source field.

Terms from any of the other searchable categories must be entered with their appropriate field prefixes. Thus, to search for publications by R. E. Stewart, the user must enter SELECT AU=STEWART, R E. To select all items indexed by the category code for dairy products he must enter SELECT CC=2010.

A full discussion of the retrieval codes and their use is given on the following pages.

RETRIEVAL CODE SUMMARY

A. Primary Inverted Index Fields (Suffix Codes)

<u>Code</u>	<u>Description</u>	<u>Sample Entries</u>
/AB	Terms appearing in abstracts of FNIC & AGECON records	# PROTEIN/AB
/CS	Corporate source terms	# OHIO/CS
/DE	Descriptors assigned to FNIC & AGECON items, subject headings from cataloging, and geographic descriptors	# NUTRITION/DE
/TI	Title or title enrichment words	# PECAN/TI

B. Formatted Field Codes (Prefix Codes)

AU=	Personal author entries	# AU=ROONEY, L W
CC=	NAL category codes, 1972	# CC=4015
DT=	Document type	# DT=MONOGRAPH
JA=	Journal announcement	# JA=7506
JN=	Journal name or abbreviation	# JN=J PLANT SCI
LA=	Language abbreviation	# LA=GER
LO=	Location or file segment containing the record	# LO=FNC
NO=	NAL call number	# NO=HD9000.5?
OC=	Old NAL category codes, 1970 - 1971	# OC=35
RN=	ID number of entry on AGRICOLA tape	# RN=74-9000762
SC=	Source code for FAO, USDA, Experiment Station, & Extension Service publications	# SC=USDA
SD=	Search date, i.e. date of publication	# SD=19730615 [June 15, 1973]
SM=	Search month, i.e. date of publication	# SM=197306 [June, 1973]
SY=	Search year, i.e. date of publication	# SY=1973 [1973]
UD=	Update number of data base by Lockheed	# UD=7705

Primary Inverted Index

The four fields making up the Primary Inverted Index represent the most frequently searched portions of the AGRICOLA data base. If no field retrieval code is specified in an EXPAND or SELECT command, the DIALOG system will default to this index. Thus, SELECT BROWN will create a set with the term BROWN appearing in a title, an abstract, a descriptor, or in the name of a corporate source. Personal authors with the last name Brown would not be searched by such a command.

Only terms in the Primary Inverted Index can be searched by the technique called full text searching. This technique is discussed in section III-E.

Abstract /AB

The abstract field includes single-word terms from abstracts. At present only the AAEDC and FNIC files contain abstracts. The differences in specificity of usage between words used in titles and the same words appearing in abstracts may occasionally pose problems for the searcher and produce for him numerous false positives. To eliminate words in the abstract field from a search because they are giving false positives, select terms with limiters other than /AB. For example, SELECT ECONOMICS/T1,DE will create a set containing the word ECONOMICS only as it occurs in the title or the descriptor fields.

Corporate Source /CS

This field includes single words from the names of corporate authors and from corporate entities issuing publications, particularly units of USDA, FAO, and the various extension services and experiment stations around the country. Authority for the entry of corporate bodies is the library's Corporate Entry Authority File (CEAF); if not found there, the entry is transcribed as it appears on the piece being indexed.

Remember, stop words cannot be used for searching, but they must be counted if the user employs the full text searching technique to locate a corporate source. To illustrate, a user trying to locate publications by the Association for International Development cannot use the word "for" as part of a select command since it is a stop word, yet he must count it in formulating a command for full text searching. He would enter the following:

```
# ASSOCIATION(1W)INTERNATIONAL(W)DEVELOPMENT/CS.
```

Since the Corporate Source field can be searched only by single words, a searcher trying to retrieve a comprehensive group of documents from a corporate body should expect to use several variations in order to accomplish his goal. Both "California" and "Calif," for example, would be reasonable alternatives in searches for publications by organizations such as the California Department of Food and Agriculture or the California Board of Forestry.

Descriptor /DE

This field includes the subject heading assigned to monographs, geographic descriptors assigned to articles, and the subject headings assigned to material indexed or cataloged by the

Food and Nutrition Information Center and the American Agricultural Economics Documentation Center. NAL used its own subject headings for monographs through June 1972; since July 1972, Library of Congress subject headings have been used in cataloging records. In 1973 the Indexing Section began using political geographic descriptors, and in 1975 started expanding the list and changing some to be compatible with the AGRIS and MARC geographics (see section II-D for a complete list).

Users particularly interested in the FNIC and AAEDC data bases should write these centers for information regarding their subject heading lists. NAL, FNIC, AAEDC, and the Library of Congress may each have used a different subject heading for the same thing; for instance, for vitamin A, FNIC uses VITAMIN A and NAL used VITAMINS (A), while AAEDC and LC have no subject headings for vitamin A.

Descriptors are in the Primary Inverted Index both in their bound, precoordinated form and as individual words. Thus, one may search for CONSUMER EDUCATION as a two-word descriptor or as the separate terms CONSUMER and EDUCATION. Entering the two-word phrase will automatically limit retrieval to the descriptor field, while entering the individual terms and coordinating them with the Boolean AND will retrieve from the entire Primary Inverted Index.

Title /TI

This field includes all single words (except 12 stop words) appearing in the titles of articles and monographs in the data base. Foreign language title words in the Roman alphabet--plus their English translations are included in this field. Because the terms in this field are essentially free text words, the user will need to make sure that he has selected all possible variants of useful search terms that might appear in titles. British spellings, for instance, would be on potentially troublesome area in title word retrieval.

Formatted Fields

All other categories of the AGRICOLA record that are searchable must be searched with one of the formatted field prefix codes. These fields include personal author, the subject category codes, NAL call numbers, item locations, document types, source codes, journal names, languages, publication dates, system update tape numbers, and item identification numbers.

Author AU=

Only personal authors, editors, or compilers will be found in this field. Corporate authors are part of the Primary Inverted Index field. Names for cataloging records will be established according to standard Anglo-American cataloging practice. For indexing records and AAEDC records since early 1977 the last name is entered first, then a comma, space, initial, space, initial: e.g., NO.AU=LITTLE, E L. If there is another initial or JR or SR, that element is added after another space, e.g., AU=LITTLE, E L Jr. FNIC records and the earlier AAEDC citations frequently contain an authors full name as it appeared on the publication.

In searching the personal author field, one should always use the EXPAND command and select terms from the display. Never guess about the form of personal author entries since the same author's name may be entered in several different ways.

Category Codes (1972-present) CC=

The numerical subject classification enables the user to free himself a bit from problems inherent in searching the relatively uncontrolled vocabulary in the AGRICOLA data base. Coupling keywords with one or more of the category codes enables the user to limit his search to a fairly specific subject area without having to enter a vast number of additional word qualifiers. For example, the category code for human nutrition (1510) coupled with a term such as CORN will allow the user to narrow his search very quickly to this area without having to specify a long list of additional search terms. Care must be used, however, in using the codes. Because the categories still tend to be less specific than might be desired in some areas and since NAL indexing policy generally precludes multiple assignments of category codes, too great a reliance on them may cause the user to miss potentially valuable items.

The list of category codes now used by NAL was adopted in 1972 (see complete list in section II-D). See the entry for Old Category Codes below for an explanation of the codes used prior to 1972.

Document Type DT=

There are five types of documents that are specifically tagged for retrieval in AGRICOLA:

1. DT=MONOGRAPH. Cataloging records for a monograph, a separately cataloged monograph in a series, or an analytic of a monograph in a series are tagged with this designator. The item itself may be anything from a two page leaflet to a multi-volume work.
2. DT=SERIES. Cataloging records for items in a numbered series and for other serials (open entries) are designated as SERIES. The record will be in the AGRICOLA data base only if the title has been cataloged since 1970.
3. DT=BIB. This designation has been used since February 1974, to tag any publication with three or more 6x9 sized pages of bibliography.
4. DT=REVIEW. Tagging of review articles began in February 1975.
5. DT=TRANSL. This tag is used for a) articles indexed from journals, which are usually cover-to-cover translations, b) items from the NAL translation file, and c) articles which appear both in English and in other languages. Articles with only summaries in English are not tagged as translations.

Journal Announcement Date JA=

This field, consisting of the last two digits of the year and two digits indicating the month (e.g., 7407 for July 1974), allows the user to search a specific issue of the AGRICOLA tapes. This designator--in use between June 1973 and April 1974 - is particularly useful for updating searches that have been run previously. Publication in the *Bibliography of Agriculture* will be

the month following the journal announcement date. Since mid-1974 the Update field (UD=) has been used in all DIALOG data bases, so it should now be preferred to this field for identifying citations entered during a single month.

Journal Name JN=

This field contains a listing of journal names (with postings) abbreviated according to the rules of the *American Standard for Periodical Title Abbreviations*. This Journal Title Abbreviation File is continually updated, so the user should do an expand to identify one variation under which a particular journal might be entered. A set made from the call number from one citation will include all title variations of the journal, unless it has been recataloged.

Language LA=

Three-letter tags are included for the language of each item in the AGRICOLA data base. A complete list of the language abbreviations can be found in section II-D.

Location LO=

This designator allows the user to isolate special collections in the AGRICOLA data base, either for searching separately or for purposes of excluding those items from another search strategy. The largest such collections in the data base at present are the Food and Nutrition Information Center collection (LO=FNC) and the AAEDC's AGECON collection (LO=AGE), but other collections such as NAL's reference collection (LO=REF) and their rare books collection (LO=RAR) can also be isolated through use of this field code. An EXPAND of LO=AAA will produce a complete list of the special locations.

NAL Call Number NO=

The call numbers from cataloging before 1966 are entered with a space between the class and book number, e.g., 389.8 SCH6 . LC numbers (used since 1966) are entered without spaces except before the year as part of the call number, e.g., RC620.A1N8 1973. Call numbers also include the format designators TRANSL, FILM, FICHE, or AV, as prefixes. To retrieve all citations in a given format, one needs only to enter NO= plus the appropriate format designator. NO=TRANSL, for instance, will retrieve the items that have been cataloged for the NAL translation field.

Since 1953, USDA publications have been cataloged with an A prefixed to the classification number (e.g., A50.9 R31). Rare books have a prefix of an R with a space (R S176.R4 1657); folio books, FO or FOLIO; maps MAP; and Bee Culture Library holdings, BEE or BEE CULTURE.

Old NAL Category Codes (1970-1971) OC=

Prior to adopting the new scheme of category codes in 1972, NAL used 18 broad numerical subject categories. They are listed in section II-D. Format for entering one of the old category codes is OC= plus a two-digit number for the appropriate subject, e.g., OC=35 for entomology. For the more detailed numerical codes in use since 1972, **consult** the Category Code field CC=.

Identification Number RN=

This field consists of unique identification numbers for citations in the AGRICOLA system (since 1973). The ID tag consists of two digits denoting the year the item was entered into AGRICOLA followed by a seven-digit number for that particular item, e.g., # RN=74-9007216.

Source Code SC=

The Source Code field allows the user to identify documents issued by four leading sources of agricultural research:

1. SC=USDA. Items published by the U.S. Department of Agriculture.
2. SC=FAO. Items published by the Food and Agricultural Organization of the United Nations.
3. SC=EXT. Items published by State agricultural extension services.
4. SC=EXP STN. Items published by State agricultural experiment stations.

For items entered **into** CAIN since May, 1973, one can enter the name of the State limited to corporate source (NO.IOWA/CS) and combine it with the Source Code for experiment station or extension service publications to isolate that institution's recent documents. Exceptions occur for State Extension Service publications where the name of the land-grant institution does not contain the name of the State, e.g., Rutgers, Clemson, Auburn, or Purdue.

A fifth source code SC=OTHER US has been added to this field. When the National Agricultural Library began preparing records in 1976 for the International Agricultural Documentation project, AGRIS, it was necessary to identify works published by other publishers in the United States, so this element has been regularly added to appropriate American publications.

Search Date SD=

This field consists of eight-digit designators for the publication dates of the items in the AGRICOLA tapes. The number is constructed in year-month-day order - 19730628 for June 28, 1973. All items in this field will be subsumed by the broader entries for the search month and search year categories; that is, all entries posted to SD=19730628 will also be retrieved by entering SM=197306 or SY=1973.

Search Month SM=

This field consists of six-digit year-month designators for publication dates of items in the AGRICOLA data base. Entries in this category are subsumed by SY= as well.

Search Year SY=

This field allows the user to search by year of publication of the items in the data base. The search year designator has no relation to the time the piece appeared in AGRICOLA; it is simply the date on the piece being cataloged or indexed. The date a conference or symposium was held is not searchable; the search date for these cases is the date of publication of the proceedings.

Update UD=

This field, like the Journal Announcement field (JA=), consists of the last two digits of the year plus a two-digit designator for the month. Coupling a subject search with appropriate update numbers allows the user to limit his search to specific months of the AGRICOLA data base. The most recent tape update is entered twice – once with its proper year-month designator and once with the designator 9999. Thus, a user who does not remember the latest update number can simply enter # UD=9999 and automatically get postings for the latest update.

E. SPECIAL SEARCHING TECHNIQUES

Search Save

Selected search specifications can be saved in the computer for future use. Thus, lists of terms or entire search strategies can be stored and re-executed without having to re-enter each statement individually. If no search elements unique to a certain data base are used (such as category codes), the saved search can be used with any data base offered by Lockheed.

The main steps involved in the search save technique are outlined here. For purposes of illustration, let us assume that the user wishes to store specifications for the concept "essential amino acids."

Step 1. Storing the search specification:

Do the search to be saved after a BEGIN command of some sort. *Only* SELECT and COMBINE commands should be used in creating the search strategy. Do not select any terms from an EXPAND display; the E numbers will refer to different terms as additional search terms are interfiled into the alphabetic index.

EXAMPLE

```
? !10
      30NOV77 15: 10:49 USER1986
$0.08 0.003 HHRS $FILE 10*
$0.02 TELENET
$0.10 ESTIMATED TOTAL COST
FILE10*: AGRICOLA 70-77/OCT
SET ITEMS DESCRIPTION(+=OR;*=AND;-=NOT)
-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
```

```

? *ARGININE;*HISTIDINE;*ISOLEUCINE;*LEUCINE;*LYSINE
      1   258  ARGININE
      2   113  HISTIDINE
      3    52  ISOLEUCINE
      4   232  LEUCINE
      5  1106  LYSINE
? *METHIONINE;*PHENYLALANINE;*THREONINE;*TRYPTOPHAN
      6   824  METHIONINE
      7   369  PHENYLALANINE
      8   123  THREONINE
      9   473  TRYPTOPHAN
? *VALINE;*ESSENTIAL(F)AMINO;*LIMITING(F)AMINO;
     10    75  VALINE
     11   141  ESSENTIAL(F)AMINO
     12    43  LIMITING(F)AMINO
? *SULFUR(F)AMINO;*SULPHUR(F)AMINO
     13    90  SULFUR(F)AMINO
     14    57  SULPHUR(F)AMINO
? $1 - 14/OR
     15 3500 1 - 14/OR
? END/SAVE
SERIAL*12JQ

```

The serial number should be recorded by the user, as there is no convenient way of determining online what serial numbers have been assigned to stored searches. The strategies saved by this technique are tied to the password in use at the time they are created, so users who operate with several passwords should also note which passwords are associated with specific serial numbers.

Step 2. Using the saved search:

The user can call up a previously stored search for use in either of two ways. If he wishes to review the content of the stored strategy before using it, he enters .RECALL plus the serial number. After viewing a display of the terms and combinations in the strategy, he can then have the strategy performed by entering .EXECUTE. If a prior review is not needed, the user can have the strategy activated directly with .EXCUTE plus the serial number. In either case the DIALOG program will perform each step in the stored search, report the results of each operation, and then create a numbered set containing the results of the last executable statement in the strategy. Postings for the intermediate sets are printed out as items of information; no access to them for further manipulation is possible.

To continue our example, let us say that the user is conducting a search on peanuts and decides to use the "essential amino acids" stored search.


```

? *PEANUT?;*GROUNDNUT?;*GROUND(W)NUT;*GROUND(W)NUTS
    1 1891 PEANUT?
    2 826 GROUNDNUT?
    3 15 GROUND(W)NUT
    4 1 GROUND(W)NUTS
? $1-4/OR
    5 2636 1-4/OR
? .EXECUTE12JQ
    258 ARGININE
    113 HISTIDINE
    52 ISOLEUCINE
    232 LEUCINE
    1106 LYSINE
    824 METHIONINE
    369 PHENYLALANINE
    123 THREONINE
    473 TRYPTOPHAN
    75 VALINE
    141 ESSENTIAL(F)AMINO
    43 LIMITING(F)AMINO
    90 SULFUR(F)AMINO
    57 SULPHUR(F)AMINO
    3500 1-14/OR
    6 3500 SERIAL* 12JQ
? $5AND6
    7 25 5AND6

```

Several things should be noted from this example. First, a saved search can, in most cases, be called up for execution at any point in an online session. Extremely long or heavily posted saved strategies should probably be executed at the beginning of a search however. Second, the results of the saved search is reported as another set in the strategy and can be used just like any other set--which it is.

This technique can be used effectively to provide current awareness SDI service. The searcher simply executes a saved search profile and then combines the resulting set with another set containing the citations in the latest update to the AGRICOLA file.

Step 3. Releasing saved searches:

When a saved search is no longer useful or has been replaced by a more complete profile, the old search should be erased from the computer's storage in the following manner: first, recall the strategy (.RECALL plus serial number) and then enter the command .RELEASE. Because .RELEASE can potentially wipe out hours of work, the DIALOG program insists that the strategy be first recalled.

A strategy should not be released until the user is completely finished with it and wishes to purge it entirely from the DIALOG system. If he is simply finished with the strategy for a particular search and may still have further need for it later on, he need do nothing after he has used it. DIALOG will maintain the strategy regardless how many times it is executed.

There is no maintenance charge for storing a saved search if it is released during the month in which it was created. Those saved for a longer period are charged 10 cents a month for each line of the saved search specification. Thus, to save the "essential amino acids" search would cost \$1.50 per month.

Full Text Searching

Terms are entered in the Primary Inverted Index (terms from the descriptor, corporate source, title, and abstract fields) in such a way that this part of the file can be searched with the technique called full texting. This technique allows the user to choose:

- 1) more than one term with a single select command,
- 2) multiple terms according to the field in which they appear in the citation (descriptor, corporate source, title, or abstract) irrespective of word order or proximity in the field, and
- 3) the position of terms with respect to one another in any of the four fields.

Only the SELECT command can be used in full text searching. There are three designators that are employed in this technique:

(C) To specify occurrence of terms anywhere within a citation in any position with respect to one another use (C)- "citation." For example, SELECT FOREST(C)SERVICE will create a set containing all citations in which both FOREST and SERVICE appear irrespective of their relative positions. This entry is equivalent to creating a set with FOREST, a set with SERVICE, and then combining them with AND. A citation such as "Forest Products Outlook, 1974. Agricultural Research Service" could be retrieved by this command.

(F) To specify occurrence of terms anywhere within the same field in any position with respect to each other, use (F)- "field." For instance, SELECT FOREST(F)SERVICE will create a set consisting of all citations in which both FOREST and SERVICE appear in the same field. An entry such as "Forest Rangers in Service to Stranded Vacationers" could be retrieved by this command.

(W) To specify the position of terms with respect to one another use (W)- "word." SELECT FOREST(W)SERVICE will find all occurrences of the term FOREST followed immediately by the term SERVICE. A number of intervening words may be specified; this capability can be particularly useful when searching for names of phrases which contain one of the DIALOG stop words (e.g. of, or, for). For example, if the user entered the command SELECT ASSOCIATION(3W)ADVANCEMENT. a set would be created consisting of all citations which contain ASSOCIATION followed by ADVANCEMENT with *up to* three words intervening. Given such a command, the system automatically defaults to 2, 1, or no intervening words. Thus, publications by the American Association for the Advancement of Science would be retrieved by this command.

Selecting terms by field or by word position can be further specified by adding a field suffix.

/TI SELECT FOREST(F)SERVICE/TI will retrieve citations where the two words appear somewhere in the title field.

/DE SELECT CONSUMER(F)EDUCATION/DE will result in a set of citations containing the two words somewhere in the descriptor field (subject headings).

/CS SELECT FOREST(W)SERVICE/CS will retrieve all citations in which FOREST and SERVICE are adjacent in this order in the corporate source field.

/AB SELECT SCHOOL(F)LUNCH/AB will find all citations where the two words are present in the abstract field of FNIC and AAEDC citations.

ERROR MESSAGES

Message	Interpretation and Remedy
BAD LINEAR-RECORD FORMAT	Linear Record format not as expected. System error - report to operator or ignore.
BOOLEAN STRING TOO LONG	Boolean string exceeds resources required to handle it. Break up COMBINE expression into parts.
COMMAND-EXECUTION ABORTED	Usually due to not enough free core storage. Try another command.
COMMAND-EXECUTION ERROR	Resources exhausted during execution of command. Try again.
DISK STORAGE OVERFLOW	Secondary storage resource for the user has exhausted during execution of command; Do desired prints then end. Notify operator.
ED001001. NOT IN FILE	Document is not in Linear File.
EMPTY ARGUMENT STRING	An argument is expected. Check manual or EXPLAIN.
EMPTY MESSAGE STRING	SEND MESSAGE has no message string.
EXCESSIVELY LONG ARGUMENT	Break up command or retry.
EXTERNAL FILE I/O ERROR	Error in transfer of data from a secondary storage (usually Inverted File, Inverted File Index, Linear File, or Linear File Index).
INPUT I/O ERROR	Error occurred during transfer of data from secondary storage device. Retry command.

ERROR MESSAGES CONTINUED

Message	Interpretation and Remedy
INVALID ARGUMENT	Entered argument is not in expected format. Check manual or EXPLAIN.
INVALID ARGUMENT 1	Invalid specification.
INVALID ARGUMENT 2	Invalid specification.
INVALID COLLECTION NUMBER	Collection number entered during BEGIN SEARCH query is not authorized to user. Redo BEGIN.
INVALID COMMAND CODE	Command code not recognizable, PAGE command, but no display on screen. Reenter command.
INVALID COMMAND CONTINUATION	A chain of commands with no arguments has spanned a set of items. Break up command chain.
INVALID FORMAT CODE	Command's format code argument is invalid.
INVALID IMPLICIT COMMAND	Commands with no arguments are entered without first setting up conditions for their entry. Check manual for proper entry.
INVALID ITEM-RANGE SYNTAX	An item-range does not occur where one is expected.
INVALID MESSAGE-SEPARATOR	SEND MESSAGE has invalid argument format.
INVALID SET-RANGE OPERATOR	Combine set range (i.e., 1-5/*) has an invalid set operator after the slash. Check manual and reenter, or break up range into smaller parts.
INVALID SET VALUE	Set value is zero or too large.
NO CORE AVAILABLE	Not enough free core storage for successful command execution. Try again then notify operator.
NO DISPLAY FOR ITEMING	An ITEM command was entered, but there is no display on the TV scope.

ERROR MESSAGES CONTINUED

Message	Interpretation and Remedy
OUTPUT I/O ERROR	Error occurred during transfer of data to secondary storage device. Reexecute command or try another.
PARENTHESES MISMATCH	Number of right parentheses does not match number of left parentheses. Reenter command.
RANGE MONOTONIETY ERROR	The low value of an argument range is higher than the high value.
SET NUMBER -- SYNTAX ERROR	A set number does not occur where one is expected.
TARGET-TERMINAL NONEXISTENT	SEND MESSAGE has invalid terminal number.
TARGET-TERMINAL SYNTAX ERROR	SEND MESSAGE terminal NO. format error.
TERM NOT IN DICTIONARY	Index term argument is too high.
UNKNOWN ERROR CONDITION	Should never occur. Try another command.
98 SETS ALREADY GENERATED	A total of 98 user sets is allotted for a search.

SECTION IV:

ORBIT IV SEARCHING

A. SYSTEM PROTOCOLS

System Cues

After having successfully logged in either through direct dial or a telecommunications network, the user enters a dialog with the ORBIT IV search program. Messages to the user and responses by the computer to input are always preceded by the cue, PROG:. After the ORBIT program has finished responding to the user's input, it will signal its readiness to accept a new entry by giving the cue, USER:. The system will not accept anything from the searcher until this cue is given.

Messages to the System

Once the cue USER: has been given, the searcher can enter one of three types of messages: (1) search statements, (2) commands, or (3) responses.

1. Search Statements

Search statements are the primary means of instructing the program to select and/or combine search terms. In one search statement the searcher may enter either a single search term or a series of search terms connected by Boolean operators AND, OR, or AND NOT. Punctuation marks are not used in entering a search statement. Spacing of input terms is important in ORBIT IV; the user should put normal spacing between all elements of the search - just as he would in typing a sentence. Each of the following example entries is a properly formulated search statement:

SS 1 /C?
USER:
SORGHUM

or

SS 1 /C?
USER:
CORN AND TEMPERATURE AND YIELD

or

SS 1 /C?
USER:
FREEZE AND DRIED AND 203000 (PCC)

In the third example note that the category code for horticultural products (203000) was used as a search term. Elements from any of the directly searchable categories of the unit record may be chosen as search terms. If no field designator is specified, the program will search the Basic Index (/BI).

These terms may be entered in truncated form if the user chooses. Truncation in ORBIT is accomplished in two ways: 1) single character substitution is done with the number symbol (#), and 2) multiple character substitution is done with the colon (:). The examples below will illustrate the techniques.

SS 1 /C?	Here the index term DUCK followed by either
USER:	a space or one other letter would be retrieved.
ALL DUCK #	
PROG:	
SS 1 PSTG (680)	
SS 2 /C?	Here the index term DUCK followed by one
USER:	or more letters or spaces will be retrieved.
ALL DUCK:	This search would retrieve not only DUCK
PROG:	but also DUCKS, DUCKLINGS, DUCKWEED,
SS 2 PSTG (862)	etc.

Note that in the examples the search term was preceded by ALL. If the user does not specify that he wishes to retrieve all occurrences of the base term, he will receive a multimeaning message from ORBIT similar to the one below:

```
SS 3/C?
USER:
RAIN:
PROG:
MM- -MULTIMEANING (RAIN:) (66)
ALL OR NONE?
```

In this case the program found 66 different search terms beginning with RAIN and it asks the user whether he wishes to retrieve all of them or none of them.

2. *Commands*

During his online session the user may want the system to perform some task not directly related to selecting and combining search terms; commands allow for him to issue these instructions. A command may be entered at any time after the user gets the readiness cue USER: It should be preceded by the name of the function to be performed as illustrated below:

```
SS 3 /C?
USER:
NEIGHBOR BROWN, K /AU
```

This particular command will allow the user to view a group of terms in the personal author index alphabetically adjacent to the name "Brown, K." Commands may be entered either in their spelled out form or in an abbreviated format; a complete list of ORBIT commands and their abbreviations is given in section IV-C.

3. Responses

Frequently, the ORBIT program will need to ask the user a question before it can complete its instructions. Whenever this situation occurs, the program will specify a series of answers from which to choose. The user needs only to enter the appropriate response and the system will proceed. For instance, in the logging off procedure the system responds to the command, STOP with a question: DONE? (Y/N). At this point the system must verify that the user is really finished and is ready to go offline. After he gets a USER: cue, the user simply types a Y, for yes, or an N, for no, and strikes a carriage return. Depending on the response, the system will either complete the logging off procedure or return the user to his place in the search sequence.

Correcting Typographic Errors

The user may discover an error in his input message before he has sent it to the computer. He can choose to wipe out the entire line and start over with a new USER: cue, or he may wish to make a letter-by-letter correction and then send the corrected message to the computer for processing.

To erase an entire line and get a new USER: cue, simply type a \$ at the end of the incorrect line and strike the RETURN (INT, SEND) key. The printhead will go back to the left margin and print a new USER: cue.

Users of 15 cps terminals use the combination of cents/ for each incorrect letter when searching via Tymshare, or simply the backspace key when dialing in direct. For 30 cps terminals letter-by-letter corrections are made by typing a backward slash (\) or a backspace for each letter to be deleted and then typing the correct entry and sending it to the computer. For example, if the user had mistakenly typed SOYBAEN, he would correct it as follows:

```
USER:  
SOYBAEN \ \ \ EAN
```

Messages from the System

The other half of the interaction between searcher and system consists of a series of messages from the ORBIT IV program. These messages may be responses to search statements or commands issued by the user or they may be prompts from the system designed to facilitate the searching process. There are 21 program messages; a list of these messages plus brief descriptions of their function can be found in section IV-C.

Occasionally the user may desire to interrupt a response from the program, e.g., during a printing sequence. He can accomplish this function by striking the break key. The program will stop its response, and the user can then enter some command or he can get a new readiness cue by striking the space bar followed by a carriage return.

B. SEARCH SEQUENCE

Selecting the Format

As soon as the user has successfully logged in, the system will respond with the following program greeting:

```
YOU ARE ON LINE
HELLO FROM SDC/ORBIT IV. (11/15/77  11:07 A.M. PACIFIC  TIME)
YOU ARE NOW CONNECTED TO THE ORBIT DATA BASE.
FOR A TUTORIAL, ENTER A QUESTION MARK.  OTHERWISE, ENTER
A COMMAND.
```

The ORBIT data base (as opposed to the ORBIT search program) is a low cost, general purpose administrative file. A searcher should use this file to take care of nonsearch related tasks - such as checking on system developments through the NEWS command—before switching into a more costly file to begin his literature search.

Messages from the system can be received in either the tutorial or the short format. The difference between the two versions is readily apparent:

Tutorial Format

```
PROG:
SS 1/C? - SEARCH STATEMENT 1 OR COMMAND?
```

Short Format

```
PROG:
SS 1/C?
```

The user may switch from one version to another at any time through use of the Terminal Message Length command (see Section IV-C).

Simple Search Statements

As soon as he is ready to begin his search, the user should enter: FILE AGRICOLA. He will then be connected to the AGRICOLA retrieval file and will be given the cue to enter his first search statement or command. He may at that time enter either a single search term chosen from any of the directly searchable categories or a series of these terms connected by the Boolean operators. Thus, both the entry LILY and the entry LILY OR LILIES are acceptable search statements. If he does not specify a particular category for searching, the system will try to find the term in the Basic Index field. If the program encounters ambiguity at any point, it will respond with a multimeaning message (MM). With the addition of the multiword descriptors given to some items in the Food and Nutrition and the Agricultural Economics Collections and records input by the NAL cataloging section, most of the entries in the Basic Index are single-word search terms derived from titles and descriptors. To retrieve material on day lilies, then, one can enter either the phrase DAY LILIES or the combination of single words DAY AND LILIES. The former entry searches only controlled vocabulary entries while the latter searches both controlled vocabulary terms and single words out of titles.

Since the Boolean AND does not allow the user to specify either word order or proximity, false positives may occur from time to time. The stringsearching function may be employed on a subset of the file to search for any particular sequence of words, thereby eliminating these faulty coordinations. (See Section IV-E for a full explanation of Stringsearching.)

As an online searching tool, the NEIGHBOR command is helpful, particularly if the user is uncertain about the forms in which a term may appear in the index. NEIGHBOR-ing, as opposed to using right-hand truncation, can also help the user avoid selecting unwanted terms inadvertently.

Example Search: Simple Search Statements

What is available in English on the effects of moisture on growth, development, and yield of corn?

PROG:
SS 1 /C?
USER:
MOISTURE OR WATER OR RAIN OR RAINFALL

PROG:
SS 1 PSTG (17436)

SS 2 /C?
USER:
GROWTH OR DEVELOPMENT OR YIELD

PROG:
SS 2 PSTG (39397)

SS 3 /C?
USER:
CORN

PROG:
SS 3 PSTG (7206)

SS 4 /C?
USER:
1 AND 2 AND 3

NOTE: The numbers in this statement refer to the items retrieved in the previous search statement.

PROG:
SS 4 PSTG (43)

SS 5 /C?
USER:
4 AND NOT FOREIGN /FR

NOTE: In order to limit a search to one directly searchable category only, the designation for that category must be entered in parentheses.

PROG:
SS 5 PSTG (28)

COMPLEX SEARCH STATEMENTS

1. Multi-line Statements

Because ORBIT IV program will accept several terms in one search statement, the need may occasionally arise for using more than one line to enter all the terms necessary for a particular statement. To do this the user should end his initial line of input with the Boolean operator AND or OR. The program will then respond with a continuation message and another user cue as shown in the following example:

The searcher who gets to the end of a line without being able to finish a word can combine the entry by placing an equal sign (=) at the end of the character string and striking a carriage return. Once the continuation cue is given, the rest of the term can be entered. Bear in mind that continuation using the equal sign tells the system that the next characters to be entered are a part of the preceding search term. The following example illustrates the technique:

```
SS 1/C?
USER:
FIRE BLIGHT OR FIRE AND BLIGHT OR ERWI=

PROG:
CNTA
USER:
NIA AMYLOVORA OR ERWINIA AND AMYLOVORA
```

C. ORBIT COMMANDS

The ORBIT search program uses over two dozen explicit and two implicit commands applicable to AGRICOLA searchers. The functions of selecting terms and combining them with Boolean operators are performed without explicit commands; these functions are accomplished by simply entering a properly formulated search statement following the user cue. The other functions can be accomplished only through the use of one of the explicit commands. Their function and use are summarized below.

The ORBIT IV program checks each entry to see whether the first word is a command. If a command is specified, the program then performs that function based on any information contained in the rest of that statement. If no command, function is specified, then ORBIT assumes that the user simply desires to search. A summary of the ORBIT commands applicable to AGRICOLA is presented below:

ORBIT COMMANDS SUMMARY

COMMAND & ABBREVIATIONS	FUNCTIONS	SAMPLE ENTRIES
COMMENT	Sends messages to SDC staff	COMMENT
DIAGRAM DIAG	Outlines the logic of previous search statements	DIAGRAM DIAG 4

ORBIT COMMANDS SUMMARY CONTINUED

COMMAND & ABBREVIATIONS	FUNCTIONS	SAMPLE ENTRIES
ERASEALL ERSLL	Clears search history back to search statement 1	ERASEALL ERSLL
ERASEBACK ERSBK ERASBK BACKUP	Erases last search statement or entire search sequence back to a specified search statement number	ERASEBACK ERSBK TO 7 BACKUP 3
EXPLAIN EX ?	Provides online explanation of system commands, messages or procedures	EXPLAIN DIAGRAM EX DEFAULT MODE ? ENTRIES OVERFLOW
FILE	Allows user to switch to any data bases he is authorized to search	FILE AGRICOLA FILE CHEMCON
FILES?	Allows user to obtain a listing of the files available for searching	FILES?
FIND FD	Allows user to bypass answering program questions and enter search directly	FIND BROMELIADS FD BEEF OR CATTLE
FINISHED	Ends logic of a SAVESEARCH and stores statements for later execution	FINISHED
HELP	Provides online tutorial assist- ance	HELP
HISTORY	Displays record of completed search statements	HISTORY HISTORY 7
NEIGHBOR NBR	Displays a list of index terms alphabetically near a specified term	NEIGHBOR GOSSYPOL NBR SMITH, JOHN /AU
NEWS	Displays current information about ORBIT and its data bases	NEWS
PRINT PRT	Gets results of any search printed either online or offline	PRINT PRT TRIAL PRT SS 4, FULL, OFFLINE

ORBIT COMMANDS SUMMARY CONTINUED

COMMAND & ABBREVIATIONS	FUNCTIONS	SAMPLE ENTRIES
PURGE CANCEL	Erases saved searches	PURGE WHEAT5 CANCEL IRRIGATE
RECALL	Re-executes a saved search strategy	RECALL WHEAT5
RENAME RNM	Allows user to redesignate the name of any command or Boolean operator	RENAME AND TO ET RNM TIME TO @
RESTACK RSTK KEEP	Allows user to eliminate selectively unnecessary search statements	RESTACK 8,12 RST 9, 10 TO 5 KEEP 4,5,13
SAVE	Allows construction of a search and simultaneous storage of logic= for later execution	SAVE WHEAT5
SAVEOLD	Allows retroactive storage of search logic just completed	SAVEOLD IRRIGATE
STOP	Ends search session and stops online time for accounting purposes	STOP
TERMINAL LINESIZE	Allows adjustment of length of terminal output lines	TERMINAL LINESIZE 70 TERM LS 110
TERMINAL MESSAGE LENGTH	Allows choice of system message formats	TERMINAL MESSAGE LENGTH SHORT TERM ML TUTORIAL
TERMINAL SECURITY	Enables user to add an additional password to the logon procedure	TERMINAL SECURITY ECG76 TERM PW AHR73
TERMINAL STORAD	Stores mailing address for offline printouts	TERMINAL STORAD TERM S+O
TIME	Allows user to perform several timekeeping operations for his own records	TIME TIME RESET TIME INTERVAL

COMMENT

The user may occasionally need to communicate with the SDC staff regarding the service (billing, ordering, searching support materials, etc.) or he may need explanation of something regarding one of his searches. Such communications can be entered online with the COMMENT command. SDC staff members monitor these messages daily and if necessary will respond by mail, by phone, or online (short answers only). Since Search Service staff do not monitor on-line search sequences, they cannot provide immediate responses to user commands. SDC also provides a toll-free telephone line which may prove useful in resolving search questions.

ERASEALL ERSLL

The ERASEALL command allows the user to clear out his entire active search register and start another search sequence beginning as Search Statement 1. The command erases all previously completed search statements, but it does not obliterate any special instructions (e.g., RENAME instructions). See also ERASEBACK, RESTACK, and RESTART commands.

```
SS 20/C?  
USER:  
ERASEALL
```

```
PROG:  
SS 1/C?  
USER:
```

ERASEBACK ERSBK ERASBK BACKUP

ERASEBACK or BACKUP allows the user to erase only part of the statements in the search register. By entering ERASEBACK alone the user can eliminate the last search statement, thus:

```
SS 11/C?  
USER:  
ERASEBACK
```

```
PROG:  
SS 10/C?  
USER:
```

To erase an entire sequence of search statements, the user specifies the search statement number to which he wishes to be returned, in this manner:

```
SS 15/C?  
USER:  
ERASEBACK TO 6
```

```
PROG:  
SS 6/C?
```

In this instance search statements 1 through 5 have been retained in the active search register for future use, while search statements 6 through 14 in the original search logic have been erased.

EXPLAIN EXP ?

Occasionally the user may discover need for an explanation of some aspect of the online system -- a program message, the function of a particular command, or some other aspect of searching procedure. This information can be obtained through the EXPLAIN command. If the user enters only EXPLAIN, he will receive an explanation of the last program message. To get an explanation of some other feature, enter the name of that feature as part of the command as illustrated in the example which follows:

SS 4/C?

USER:

EXPLAIN NO POSTINGS

PROG:

NO POSTINGS MESSAGE:

NP - NO POSTINGS - THERE ARE NO POSTINGS FOR THE TERM ()
EXACTLY AS ENTERED. SEARCH ABORTED.

THIS IDENTIFIES TERMS IN THE SEARCH STATEMENT WHICH HAVE
NO POSTINGS. USE THE NEIGHBOR COMMAND TO CHECK WHETHER
YOU MISSPELLED THE TERM OR WHETHER IT DOES NOT EXIST IN
THE INDEX.

A complete list of explainable features can be obtained online by entering EXPLAIN EXPLAIN.

FILE

The searcher uses the FILE command to switch from one data base to another that is available to him. Entry of this command automatically erases the search sequence then on-going and starts the user afresh in the new data base.

SS 12/C?

USER:

FILE ERIC

PROG:

ELAPSED TIME ON AGRICOLA: 0.30 HRS.

YOU ARE NOW CONNECTED TO THE ERIC DATABASE.

SS 1/C?

USER:

FILES?

This command produces a display of the data bases available to the user.

SS 1/C?

USER:

FILES?

PROG:

YOU MAY ACCESS THE ERIC, CHEMCON, CHEM7071, AGRICOLA, NTIS, ORBIT, TULSA, ENERGYLINE, CRECORD, ACCOUNTANTS, INFORM, GEOREF, COMPENDEX, LIBCON/E, POLLUTION, PAPERCHEM, CDI, DEMO NTIS, GRANTS, BIOSIS PREVIEWS, MANAGEMENT, FSTA, BIOCODES, LISA, BI06973, CBPI, CNI, ENVIROLINE, OCEANIC ABSTRACTS, P/E NEWS, PNI, CIN, AND CIS INDEX DATABASES.

YOU ARE NOW CONNECTED TO THE AGRICOLA DATABASE.

FIND FD

The FIND command allows the user to enter a search statement without waiting for a readiness cue (e.g., SS 4/C?). This command is used when the user wants to avoid having to answer one of the program's questions. For instance, if the user wishes to see no more of a NEIGHBOR display, he simply enters a FIND command as soon as the program gives him an input cue.

SS 1/C?

USER:

NBR ROONEY, L W /AU

PROG:

POSTINGS TERM

4 ROONEY, JAMES R

2 ROONEY, L

36 ROONEY, L W

1 ROONEY, M L

6 ROONEY, W F

UP N OR DOWN N?

USER:

FIND ROONEY, L W /AU OR ROONEY, L /AU

The FIND command can also be used to advantage in chaining several statements together and thereby speeding up a bit the search sequence. The following example shows how the user can switch from one data base to another and have a search statement performed in one operation:

SS 1/C?

USER:

FILE AGRICOLA, FIND ALL LEGUM: OR ALL BEAN # OR ALL SOYBEAN #

PROG:

ELAPSED TIME ON BIOSIS: 0.25 HRS.

YOU ARE NOW CONNECTED TO THE AGRICOLA DATABASE.

SS 1 PSTG (4781)

SS 2/C?

USER:

FINISHED

This command marks the end of a series of search statements which are to be saved. Since FINISHED removes the user from the SAVESEARCH mode, it must be confirmed.

SVS SS 6/C?

USER:

FINISHED

PROG:

OK? (Y/N/C)

USER:

Y

PROG:

SAVE COMPLETED

HELP

Occasionally the searcher may reach a point where he doesn't know what to do next and needs some guidance. By typing HELP he can get online tutorial assistance.

SS 4/C?

USER:

HELP

PROG:

TYPE NUMBER IDENTIFYING YOUR PROBLEM AND CARRIAGE RETURN

1. AM GETTING NP OR NONE MESSAGE; NEED NEW TERMS OR THE FORM OF SOME TERMS.
2. WANT TO SEE SEARCH RESULTS.
3. THE PROGRAM ASKED A QUESTION.
4. NEED TO REVIEW OPERATING FEATURES.
5. NEED TO REVIEW DATA BASE OR UNIT RECORD.
6. WANT NAMES OF COMMANDS.

USER:

5

PROG:

HELP MESSAGE 5:

TYPE EXPLAIN UNIT RECORD

HISTORY

A detailed listing of search logic is retrievable through use of the DIAGRAM command. Frequently, however, the search analyst simply needs a listing of the search history. This function is accomplished with the HISTORY command. With this command the searcher can have displayed an entire list of completed search statements, a partial sequence or selected individual statements, and if he wishes to, he can have them displayed in either ascending or descending order.

SS 4/C?

USER:

HISTORY

PROG:

SS 1: CORN OR MAIZE OR ZEA AND MAYS (9847)

SS 2: 1 AND AMINO AND ALL ACID NO. (216)

SS 3: 2 AND GREATER THAN 1973

NEIGHBOR NBR

The NEIGHBOR command allows the user to view a portion of the online index of search terms that are alphabetically adjacent to a term he is interested in. From such a display he can ascertain the number of postings for terms and perhaps discover additional search terms to use in his retrieval strategy. Entry of the NEIGHBOR command followed by a search term will generate a five-term display similar to this one:

SS 1/C?

USER:

NBR ORANGE JUICE

PROG:

POSTINGS	TERM
2	ORANGE CO. CALIF. DEPT. OF AGRICULT OS
1	ORANGE COUNTY, CALIF. PLANNING DEPT OS
5	ORANGE JUICE IT
1	ORANGE-BROWN IT
1	ORANGE-FLAVORED IT

UP N OR DOWN N?

If the user wishes to see more terms alphabetically preceding the displayed terms, he should respond by typing UP plus the number of additional terms he wants displayed. To see terms further along in the alphabet, the user should respond DOWN plus the number of terms he wants displayed.

The user can get a larger initial display of terms by specifying in the command the number of terms to be displayed. NEIGHBOR RICE 10 will, for example, give a 10-item display of terms alphabetically adjacent to the term RICE.

Notice in the example above that the terms from all the searchable categories are interfiled. To get a display of terms from only one searchable category, the user simply specifies the category after the search term in the command statement, thus:

```
SS I/C?
USER:
NBR MCWILLIAMS AU

PROG:
POSTINGS      TERM
  I          MCWILLIAM, N
  I          MCWILLIAMS, A
  I          MCWILLIAMS, A L
  I          MCWILLIAMS, E
  2          MCWILLIAMS, E L
UP N OR DOWN N?
```

NEWS

The NEWS command provides users online information about new developments with the ORBIT program or with any of the data bases in the system (updates, changed, etc.). Users should enter this command the first time they log in to the ORBIT system each week so that they can be apprised of any changes that might affect their searching.

PRINT PRT

Once he has received a postings message for a search statement, the user can view all or any number of the retrieved citations through use of the PRINT command. The ORBIT program allows the user great flexibility in choosing the categories of information to be displayed. He may, for instance, choose to see author, title, and source reference, or only titles and descriptors; and he may choose to have the citations printed online at his terminal or he may have them printed offline by SDC staff and mailed to a patron's address. A summary of the printing options is given in the sections that follow.

Standard Print Commands

There are three standard printing options which will display predetermined categories of information from the unit record.

1. PRINT FULL. Displays online all printable categories from one unit record. The category labels will be printed in their compact or abbreviated form. More than one record may be seen by specifying how many citations are to be printed at one time; for example, PRINT FULL 5 will produce a display of 5 full unit records.

2. PRINT TRIAL. This printing option is particularly useful in assessing the quality of retrieval during the search process. The "PRINT TRIAL" option displays the titles, category codes, descriptors, and ID numbers of two unit records. From this information the

user can determine whether his search strategy is retrieving relevant citations, and he can perhaps identify additional search terms to use in retrieving additional items. The user can get more than the usual two citations printed by specifying the number to be displayed in the command, e.g., PRINT TRIAL 4.

3. PRINT. The PRINT command entered alone will produce a display containing all the key bibliographic elements in five unit records. These elements are from the following AGRICOLA unit record categories: title, author, corporate source, source reference, publication date, category codes, document type, call number, and ID number. As with the other standard print options, the user can override the default on number of records printed by specifying the number he wishes to see when he enters the command.

Sample standard print displays:

PRINT FULL

PROG:

TI - THE MECHANISM OF CLOUD LOSS PHENOMENA IN ORANGE JUICE
AU - KROP, J J P
SO - WAGENINGEN, 107 P. ILLUS.
PD - 1974
NO - BIBLIOGRAPHY: P. 101-107
SE - AGRICULTURAL RESEARCH REPORTS 830
PCC- 203000
DT - MONOGRAPH
LA - ENG
CN - 105.2 V61V NO. 830
ID - 759653290

PRINT TRIAL

PROG:

TI - THE MECHANISM OF CLOUD LOSS PHENOMENA IN ORANGE JUICE
PCC- 203000
ID - 759653290

PRINT [

TI - THE MECHANISM OF CLOUD LOSS PHENOMENA IN ORANGE JUICE
AU - KROP, J J P
SO - WAGENINGEN, 107 P. ILLUS.
PD - 1974
PCC- 20300
DT - MONOGRAPH
CN - 105.2 C61V NO. 830
ID - 759653290

Tailoring Print Commands

The standard print commands may not always serve the user's needs. In such cases he can tailor the print display in any of a number of ways. The following PRINT command illustrates the various options available to the user:

<u>PRT</u>	<u>OFFLINE,</u>	<u>SS 7,</u>	<u>AU,TI,SO,PD,</u>	<u>SORT</u>	<u>AU,TI,</u>	<u>INDENTED,</u>	<u>SKIP 1000,</u>	<u>STORAD</u>
1	2	3	4	5	6	7	8	

1. *Command.* Every printing command must begin with a set of double quotation marks and the word PRINT or its abbreviation PRT. Never enter a comma after the name of the command.
2. *Offline Printing Option.* The default mode for printing is online, so unless the user specifies OFFLINE in his print command, he will receive the citations online at his terminal. Entering OFFLINE as part of the print command will cause the citation to be printed at the SDC facility, and the printout will be mailed to the address specified by the user. Default for offline printing is up to 1000 citations. If the user wishes to have more than that number printed, he must use more than one printing command and employ the skip option (see option 7).
3. *Search Statement Number.* The user may choose to have printed the citations from any completed search statement, i.e., for which a postings message was received. If he does not specify which search statement is to be printed, the program defaults to the last statement and prints it.
4. *Categories for Printing.* Any of the printable categories from the AGRICOLA unit record may be included in or excluded from a print command. In a tailored print command in which unit record categories are specified, the ORBIT program prints the categories in the order they are listed in the command statement. For instance, the sample print command above requires that the four categories be printed in the following order: author, title, source, and publication date.

The standard print command options are also available for offline printing. Thus, PRT FULL OFFLINE will get a printout containing all printable categories for each citation. Occasionally, the user may find it advantageous to use either the PRINT or PRINT FULL option and simply exclude unwanted categories in the following manner:

PRT FULL OFFLINE EXCLUDE DT,ID,SN

Such a command will print all categories normally printed in a PRINT FULL except for document type, ID number, and source name.

When entering printable categories in print commands, user *must* separate category designators with commas. Use of commas to separate other parts of the printing specifications is purely optional; consistent use of commas, however, may be simpler to remember.

5. *Sorting Offline Printouts.* The usual order for printing citations both on and offline is reverse chronological order; that is, the most recent addition to the AGRICOLA data base is the first thing printed out. The user can, however, choose to have his printout sorted in some other fashion - for example, by author and title or by call number. Citations may be sorted according to any printable category in ascending order - A to Z, smallest number to largest - by use of the term SORT, or they may be sorted in descending order - Z to A, largest to smallest - by using the term SORTD. The terms SORT or SORTD must then be followed by the abbreviations for the categories which are to be the basis of the sort - SORT AU for an alphabetic sort by author, A to Z.

6. *Indented or Compact Category Labels.* The ORBIT program usually prints the labels for the various unit record categories in their abbreviated form - TI, AU, SO, etc. Some users, however, may wish to have these labels spelled out, particularly if the printout is to be given to a patron unfamiliar with reading the AGRICOLA citations. To get the category labels spelled out, enter INDENTED as part of the print command.
7. *Skip Option.* Since ORBIT normally prints citations in sequential order, the user must use the skip option if he wishes to view citations out of regular sequence. To illustrate, the command PRT TRIAL SS 5 SKIP 50 will produce a display of citations 51 and 52 from Search Statement 5.
8. *Stored Address.* The user may wish to store one address to which all printouts will be sent. This task is accomplished through use of the STORAD command. Once the address has been stored, the user simply enters the term STORAD as part of the printing command, and the computer will then use the stored address for mailing the printout. If STORAD is not entered as part of the printing command, the user must then enter address information before the command will be processed.

PURGE CANCEL

If the user is finished with a search logic which has been saved, he can clear those specifications from the system with the "PURGE" or CANCEL command plus the name of the saved search - e.g. "PURGE TREES". Because this command can erase a substantial amount of work, the ORBIT program asks for confirmation before it will perform the function.

```
SS 5/C?  
USER:  
PURGE TREES
```

```
PROG:  
OK? (Y/N/C)
```

```
USER:  
Y
```

```
PROG:  
PURGESEARCH COMPLETED.
```

RECALL

After a search strategy has been saved, it can be reexecuted later in the day in the same or a different data base through the use of the RECALL command plus the name given the saved search. In executing the saved search, the program may generate some time overflow messages or some multimeaning messages; simply respond to such messages until the system has resolved any ambiguities and has had time to complete its work. The end result of a RECALL command is a series of postings messages for the search statements in the saved strategy. Each of these statements is accessible to the searcher and can be used in conjunction with other search parameters.

SS 1/C?
USER:
RECALL METALS1

PROG:
SS 1: IRON OR FERROUS OR FERRIC OR FE OR ZINC OR ZN (9544)
SS 2: 1 AND ALL ABSORPTION OR 1 AND ALL METABOL: (1165)
SS 3: 2 AND GREATER THAN 1973 (960)

RENAME RNM

The RENAME command allows the user to redesignate the name of any program command, any Boolean operator, and any of the PRINT command options. The renaming of ORBIT elements applies only to the user's own terminal and continues in effect only during that online session. The user can cancel any RENAME command by entering RESTART or by issuing another RENAME command.

SS 1/C?
USER:
RENAME TIME TO END

PROG:
'TIME' HAS NOW BEEN RENAMED TO 'END'.

RESTACK RSTK KEEP

RESTACK allows the user to erase completed search statements no longer necessary for his strategy while retaining selected statements in the active search register. It differs from the ERASEALL and RESTART commands in the degree of flexibility and selectivity it offers the user in choosing which search statements are to be saved and which erased. The command may be used by itself or with additional specification. Its use is illustrated in the table below:

ONLINE ENTRIES	DESCRIPTION OF OPERATION
1. Command name alone: USER: RESTACK PROG: SS 2/C?	Saves the last completed search statement, renumbers it to SS 1, erases all other statements, and gives the user a readiness cue for SS 2.
2. Command + SS number: USER: RSTK 12,15 PROG: SS 3/C?	Saves the search statements that are specified in the command, renumbers them beginning at SS 1 and gives the user a readiness cue for the next search statement in the sequence.

3. Command + renumbering specification:

USER:
RSTK 12,15 TO 7

PROG:
SS 9/C?

Saves the specified search statements, renumbers them beginning at the SS number indicated after TO, and gives a readiness cue for the next search statement. All statements prior to the beginning of the renumbering sequence are saved.

RESTART RST

The most thoroughgoing of the erasing commands, RESTART not only erases all search statements but it also cancels any special instructions (e.g., RENAME) and starts the user over at the program greeting in the ORBIT data base. The RESTART command, like the STOP command, requires confirmation from the user.

SAVE SAVEOLD

The ORBIT searcher can instruct the system to save his strategy for execution later in the day or against another data base. This function can be performed before the search is entered through use of the SAVE command; an after-the-fact save can be accomplished with the SAVEOLD command.

In order to save a search strategy as it is being created, the user cues the system by entering SAVE plus a name consisting of any string of alphanumeric characters. The name given a saved search cannot, however, contain either a space or any non-alphanumeric character. Thus, while SORGHUM1 is an acceptable name for a saved search, SORGHUM 1 is not since it contains a space. During the savesearch sequence, each search statement cue is preceded by the tag *SVS* to remind the user that that statement is also being saved. Normal searching functions are permitted while in the savesearch mode, but commands such as ERASEBACK, RESTACK, and ERASEALL should not be used, as they will create problems in reexecution. Online printing is permitted during the entry of a savesearch, but any offline printing can be done only after the user has signalled that his savesearch is complete by entering the command FINISHED. A typical savesearch is illustrated below.

SS 4/C?

USER:

SAVE SORGHUM1

PROG:

SVS SS 1/C?

USER:

SORGO OR SORGHO OR SWEET AND SORGHUM OR SUGAR AND SORGHUM

PROG:

SS 1 PSTG (173)

SVS SS 2/C?

USER:

1 AND SUGAR AND ALL LOSS: OR 1 AND ALL DETERIORAT: OR 1 AND
ALL STOR:

```

PROG:
SS 2 PSTG (38)
*SVS* SS 3/C?
USER:
FINISHED
PROG:
OK? (Y/N/C)
USER:
Y
PROG:
SAVE COMPLETED

```

Through use of the SAVEOLD command, the user is able to save search strategies after-the-fact. To accomplish this function the user enters SAVEOLD plus a search name after he has completed his initial search. The ORBIT program confirms this command with the message, SAVEOLD COMPLETED.

Once a strategy has been saved by either of these methods, the user can then have it re-executed with the RECALL command. At the present time the ORBIT system can save a strategy for one day only. Any strategies left in the computer at the end of the day will be automatically purged.

STOP

When he has completed his work online, the user must enter the STOP command in order to terminate the online accounting for that session. This command requires confirmation, as shown below:

```

SS 20/C?
USER:
STOP
PROG:
DONE? (Y/N)
USER:
Y
PROG:
TERMINAL SESSION FINISHED 11/21/77 12:02 P.M. (PACIFIC TIME)
ELAPSED TIME ON AGRICOLA: 0.13 HRS.
TOTAL ELAPSED TIME: 0.14 HRS.
PLEASE HANG UP YOUR TELEPHONE NOW. GOOD-BYE!

```

TERMINAL LINESIZE TERM LS

Occasionally the standard 80-character line output by the ORBIT program is unsuitable for a particular user. Through the TERMINAL LINESIZE command the length of any line can be altered to any size between 31 and 131 characters. Once the TERMINAL LINESIZE command

has been entered, the particular specifications required for that terminal will be associated with the password and that line length will be automatically used by ORBIT whenever that password is logged on. To change the length of the line at a later time, simply enter another TERMINAL LS command and specify the new line length requirements.

TERMINAL MESSAGE LENGTH TERM ML

ORBIT IV program messages can be displayed in two different forms - short or tutorial. Normally, the messages are displayed in short form (experienced user format). The user may elect to change the format for system messages through use of the TERMINAL MESSAGE LENGTH command.

The command follows this pattern:

TERM ML +	SHORT	+	Full name
	OR		or
	TUTORIAL		Two-letter
			abbreviation for specific
			system messages to be
			changed (optional)

For example, TERM ML TUTORIAL will get all standard program messages sent in tutorial format-useful to new searchers of the system. TERM ML TUTORIAL MM, on the other hand, will get only the multimeaning message printed in tutorial format; all other system messages will be printed in the short format.

TERMINAL STORAD TERM STO

The TERMINAL STORAD command allows the user to store an address in the computer's memory for future use in the mailing of offline printouts.

1. Entering an Address. To store an address initially or to change an address that has already been stored, the user enters:

USER:
TERMINAL STORAD

The program then will give him prompts to enter a name, a street address, and a city, state, and zip code. After the user has confirmed the information that he has entered is correct, that address will be stored for future correlation with that user password when offline prints are ordered.

2. Using TERMINAL STORAD. Once an address has been stored, all a user need do when ordering offline printing is to include the term STORAD as part of the PRINT command, e.g., PRINT OFFLINE STORAD. In response the program asks the user to supply a title for the bibliography and the name of the person to whom it will be delivered. When those questions are answered, the command will then be completed.

TIME

For many different reasons the user may wish to keep a record of his online time. By using the "TIME" command he can perform three different timekeeping tasks. There are three versions of this command:

1. "TIME" - prints the clock time in the Eastern time zone.
2. "TIME INTERVAL" of "TIME I" - prints the time that has elapsed since login or since the last "TIME RESET". Elapsed time is always rounded to the nearest minute, hence it may vary slightly from the time reported for billing purposes.
3. "TIME RESET" - This command allows the user both to get a reading of the elapsed time on the current search and to have the elapsed time counter reset to zero. This command resets the elapsed time only; search statement numbers and the accounting time for which the user will be billed remain unaffected.

PROGRAM MESSAGES

MESSAGE NAME AND LONG FORM

APPLICATION

Readiness Cue Message

SS N/C?- -SEARCH STATEMENT N OR COMMAND?- -
ENTER SEARCH STATEMENT N OR ANY COMMAND

Signals a new transaction.
User may enter a new search
or issue a command.

Number of Postings Message

PSTG- -NUMBER POSTINGS- -THE NUMBER OF UNIT
RECORDS MATCHING THIS SEARCH STATEMENT IS
().

Contains the number of unit
records yielded by the user's
search. It followed immediately
by the Readiness Cue Message.

No Postings Message

NP- -NO POSTINGS- -THERE ARE NOT POSTINGS
FOR THE TERM () EXACTLY AS ENTERED. IT
AND ALL TERMS LINKED TO IT BY THE WORD
'AND' HAVE BEEN DELETED FROM THIS SEARCH.

Indicates that no unit record
matches your search statement.
Search terms may have been
entered incorrectly or may not
exist in the index.

None, No Match Message

*NONE- -NO MATCH- -NO UNIT RECORD
CONTAINS ALL THE ANDED TERMS IN YOUR
SEARCH STATEMENT.

Indicates that no unit record
contains the two or more
terms ANDED in a given
search.

MESSAGE NAME AND LONG FORM

APPLICATION

Multimeaning Message

MM ()-()- -MULTIMEANING ()-()- -
THE TERM () HAS () MEANINGS.

Appears when a search term that has been entered has more than one meaning, i.e., occurs more than once in the index. This message frequently occurs with a truncated search (TERMNO.) or if a term occurs in more than one unit record category. If there are 5 or fewer meanings, the program will automatically display them after this message.

See? Message

SEE?- -(YES/NO/ALL) - DO YOU WANT TO SEE
THESE TERMS? ANSWER 'YES', 'NO' TO CAN-
CEL THE REQUEST, OR 'ALL' TO RETRIEVE ON
ALL OF THEM.

Follows the Multimeaning Message when there are more than 5 meanings. User is given the option of seeing the terms (with YES), deleting the search (with NO), or having the terms ORed together in a search (with ALL).

Continuation Cue Message

CNT N- -CONTINUE SS N- -CONTINUE WITH
THE NEXT ENTRY IN SEARCH STATEMENT N.

Signals the user to continue a long search statement on the next line.

Continue Printing Message

CONTINUE PRINTING? (YES/NO)

Occurs in several situations, e.g., with a Print Command, when more items are available for display than are allowed to be printed at one time.

Designate Elements Message

DESIGNATE- -DESIGNATE ELEMENTS- -TO BE
(INCLUDED, EXCLUDED), USING COMMAS.

Signals the user to continue entering a Print Command that requires more than one line.

Up N or Down N Message

UP N OR DOWN N?- -HOW MANY TERMS UP OR
DOWN?- -ENTER THE NUMBER PRECEDED BY
THE WORD UP OR THE WORD DOWN.

Allows user to continue the display of a Neighbor Command, either up or down the alphabet.

MESSAGE NAME AND LONG FORM

APPLICATION

Confirm Restart Message

DO YOU WISH TO RESTART? (YES/NO)

Requests user to confirm that he really wishes to have all transactions erased by the Restart Command.

Confirm Stop Message

STOP? THE STOP COMMAND CLOSES ALL FILES AND TERMINATES PROGRAM OPERATION. DO YOU REALLY WISH TO STOP NOW? (YES/NO)

Requests user to confirm that he really wishes to log out.

Search Series Full Message

SE.C- -SEARCH SERIES FULL, ENTER COMMAND- -PRESENT SERIES OF SEARCH STATEMENTS IS MAXIMUM. ENTER "ERASEBACK" OR "ERASEALL" TO MAKE ROOM FOR MORE SEARCHES, OR ENTER ANY OTHER@ O COMMAND EXCEPT "FIND".

Indicates that the user has entered the maximum number (20) of search statements. User enters either the Eraseback, Restack, or Eraseall Command to clear the register and resume searching.

Entries Overflow Message

ENT OVFLOW- -ENTRIES OVERFLOW- -THE NUMBER OF TERMS ENTERED EXCEEDS THE STORAGE LIMIT OF THE TERMS IN THE ACTIVE SEARCH REGISTER.

Indicates user exceeded the maximum number of search terms that can be entered in a series of search statements. User should use the Eraseback, Restack, or Eraseall Command so that additional terms may be added.

Specify Message

SPECIFY NUMBERS, ALL, OR NONE- -SPECIFY BY LIST OF NUMBERS, ALL, OR NONE- - SPECIFY WHICH TERM OR TERMS YOU DESIRE BY ENTERING THE NUMBER TO THE LEFT OF THE TERM, A LIST OF SUCH NUMBERS, THE WORD ALL, OR THE WORD NONE.

Appears after the display of terms from a multimeaning Message. User may request that one or more terms (by specifying numbers), all terms (ALL), or no terms (NONE or Ø) be searched.

Records Searched, N Qualified Message

(N) SEARCHED, (N) QUALIFIED, CONTINUE? (YES/NO)

Indicates on a cumulative basis the number of records that meet the specifications of a stringsearch or sensearch statement.

Temporary Storage Overflow Message

TEMP OVFLOW- -TEMPORARY STORAGE OVERFLOW, REARRANGE TERMS- -ONE OF THE TERMS IN THE SEARCH STATEMENT HAS CAUSED AN OVERFLOW OF TEMPORARY STORAGE. ENTERING THE BROADEST TERMS LAST IN THE SEARCH STATEMENT MAY AVOID THIS.

Indicates that user has exceeded the temporary storage allotted to him for processing records. User should try entering high-posted terms last in the search statement.

MESSAGE NAME AND LONG FORM	APPLICATION
<p><i>Permanent Record Overflow Message</i></p> <p>PERM OVFLOW- -PERMANENT RECORD OVERFLOW, RSTK- -THE PERMANENT STORAGE ALLOCATED TO YOU HAVE OVERFLOWED. RESTACK, ERASE- BACK OR RESTART BEFORE CONTINUING.</p>	<p>Indicates that there are too many unit records stored in user's storage area. User should use either Restack, Eraseback, Eraseall, or Restart Command to make room for additional records.</p>
<p><i>Generated Terms Overflow Message</i></p> <p>GEN TERM OVFLOW- -GENERATED TERM OVERFLOW BY ()- -THE TERM () HAS GENERATED TOO MANY TERMS. THE TERM MUST BE MADE MORE SPECIFIC.</p>	<p>Indicates that a truncated search or a term using a Variable Character key has required the program to scan more items in the index or to retrieve more postings than are presently allowed. User should add more characters to the truncated term or use the Neighbor Command to identify more specific terms.</p>
<p><i>Sort for Printing Message</i></p> <p>*ONLY THE MOST RECENT NNNN RECORDS WILL BE SORTED FOR PRINTING.</p>	<p>Indicates that only a specified number of the most recent records will be used in filling a print request. To print earlier records, user should limit search by date.</p>
<p><i>User Error Message</i></p> <p>(The type of User Error is identified)</p>	<p>Appears after any one of several types of user errors. The program may continue to process the request, indicate an appropriate action, or delete the request.</p>

D. RETRIEVAL CODES

Each element of the AGRICOLA unit record is tagged by a two or three letter field designator or retrieval code. Once it has properly tagged all the elements in a record, the ORBIT program files all the terms into the master integrated index used for online retrieval. When the user enters a search term such as WATER, the program then goes to the index to look for that term. If it finds that term exists only in one category, the program will give the user a postings message- e.g., PSIG (473). If the term is not found, the user will receive a NO POSTINGS message.

In many cases, however, the program will find that the search term exists in several different forms - e.g., singular and plural. When this situation occurs the user receives a multimeaning message such as the one below.

SS 4 /C?
3 AND APPLE #

PROG:
MM (APPLE' #) (2)

1 APPLE/BI
2 APPLE/BI
SPECIFY NUMBERS; ALL, OR NONE- -

A thorough understanding of each of the retrieval categories in the unit record is necessary for efficient online searching. A full description of each category is presented in the following section.

RETRIEVAL CODE SUMMARY

A. DIRECTLY SEARCHABLE CATEGORIES

CODE	DESCRIPTION	SAMPLE ENTRIES
/AN	Accession number	759063428/AN
/AU	Personal author names	NBR JONES, J J/AU WEEVIL AND RAY, A C/AU
/BI	Basic Index--single-and multi-word terms drawn from Index Terms, Titles, and Abstracts	CATTLE AND BRAZIL NBR FARM WORKERS/BI
/CN	NAL call number for the item or the source reference	ALL HD9500:/CN
/DT	Document type	POULTRY AND MONOGRAPH/DT
/FS	File segment designator for records input into one of the AGRICOLA subfiles	ALL PEANUT: AND FNC/FS COMMODITY FUTURES AND AGE/FS
/FR	Foreign language designator assigned to all non-English language publications in addition to specific language designators	HIGH AND LYSINE AND FOREIGN/FR ALL POLDER: AND FOREIGN/FR
/LA	Language of the item	3 AND NOT RUS/LA

RETRIEVAL CODE SUMMARY

A. DIRECTLY SEARCHABLE CATEGORIES

CODE	DESCRIPTION	SAMPLE ENTRIES
/OS	Organizational source (first 36 characters only)	NBR OHIO/OS IOWA AGRICULTURAL EXPERI- MENT STATION/OS
/PCC	Primary category code (first NAL numerical subject classification code assigned to a document)	ALL SALTS AND 401500/PCC
/PD	Publication date of source item	RICE AND 1975 DEC/PD
/PY	Year of publication of item	OATS AND FROM 73 THRU 74
/SCC	Secondary category code (the second subject classification number assigned to a document)	401500/PCC or 401500/SCC
/SN	Source name--one of five designators identifying special source of agricultural publications	NUTRITION AND USDA/SN MILK AND FAO/SN
/UP	Update code identifying all items on a specific AGRICOLA monthly update tape	15 AND 7506/UP

B. INDIRECTLY SEARCHABLE CATEGORIES

/AB	Words in abstracts (FNIC & AAEDC)	STRS/AB/:CONSUMER:PROTECTION
/AN	Accession number	STRS/AN/ : 75:
/AU	Personal author names	STRS/AU/ :LYLE: OR :LISLE:
/CN	NAL call number	STRS/CN/ :100 C12:
/DT	Document type	STRS/DT/ :MONOG: AND :TRANS:
/IT	Index terms- -descriptors, subject headings and geographics	STRS/IT/ :FOOD:ANALYSIS:
/LA	Language of item	STRS/LA/ :FRE: OR :GER:
/NO	Notes appearing in the AGRICOLA record describing special features of the item	STRS/NO/ :ENG: AND :SUM:

RETRIEVAL CODE SUMMARY

A. INDIRECTLY SEARCHABLE CATEGORIES

CODE	DESCRIPTION	SAMPLE ENTRIES
/OS	Organizational source	STRS/OS/ :ROHM AND HAAS:
/PCC	Primary category code	STRS /PCC/ :600500: OR :601000:
/PD	Publication date of source	STRS /PD/ :JAN: OR :FEB:
/SCC	Secondary category code	STRS /SCC/ :301000: OR :302500:
/SE	Series statement added to cataloging records	STRS /SE/ :BENCH MARK STUDIES:
/SN	Source name	STRS /SN/ :FAO: OR :USDA:
/SO	Source reference name or abbreviation	STRS /SO/ :MODERN SCHOOLS:
/TI	Title words	STRS /TI/ :HIGH LYSINE:
/TR	Designator for complete translation owned by NAL	STRS /TR/ :TRANS:

RETRIEVAL CODES

Each of the categories of the AGRICOLA unit record is described in this section. All directly searchable categories are asterisked (*).

Abstract /AB

Currently the only records in the AGRICOLA data base that contain abstracts are those produced by the Food and Nutrition Information Center and the American Agricultural Economics Documentation Center. These abstracts are not directly searchable by the ORBIT program, but they can be searched with the stringsearching or sentence-searching techniques.

**Accession number /AN*

An accession number is assigned to each citation as it is added to the file. Numbering is sequential and begins anew each year. Since 1973 2-digit year designators have been prefixed to the sequential number to make a unique number, e.g., 739068492, 749003811, etc.

**Personal author /AU*

Entries in this field are of two types-- cataloging entries and indexing entries. Personal authors' names from cataloging records are entered according to standard library practice; once

the entries are established, all succeeding items by that author will have the same entry. Indexing entries, however, are not standardized except for the practice of rendering all given names as unpunctuated initials following the surname. Personal author entries for indexing records are derived strictly from the piece being indexed and thus may exhibit a wide variety of forms in the data base. For instance, one may find entries for items by Ben Arthur David under Davis, Ben Arthur; Davis B A; or Davis, B. depending on whether the item is a cataloging record or an indexing record and depending on the fullness he used in signing any articles that might get indexed.

Because of this potential for great variation in form of entry, the user will always be wise to use the NEIGHBOR command before entering a personal author search.

**Basic Index /BI*

For purposes of direct searching, terms from the Title Word category and from the Index Term category are merged into a common Basic Index category. This category can be searched by single word terms and by multiword search terms since cataloging records and items from FNIC and AAEDC are indexed with a controlled vocabulary list that contains multi-word headings. In searching this category then, one should enter both forms of common subject headings to make sure that all relevant citations are retrieved. Thus, to retrieve all items on disadvantaged youth one should enter the following:

SS 5/C?

USER:

DISADVANTAGED YOUTH OR DISADVANTAGED AND YOUTH

Notice that if the searcher intends a search of the Basic Index alone, no qualifier is needed. The system will automatically default to this element of the unit record.

**NAL call number /CN*

Almost every entry in the AGRICOLA data base contains the call number assigned by NAL. Items initially cataloged prior to 1966 bear a call number of the NAL classification system. Items cataloged since that time bear Library of Congress classification numbers. Searching by call number can be a particularly useful technique when one wants to locate all items in a particular group of sources. For example, to find items dealing with sorghum issued by the Texas Agricultural Experiment Station one might use the following strategy:

SS 1 /C?

USER:

SORGHUM AND ALL 100 T31: /CN

PROG:

SS 1 PSTG (116)

When entering NAL classification numbers, always insert a space between the class number and the cutter number, e.g., 100 OR3C. LC Classification numbers are entered without spaces, e.g., HD9205.A3C8. A year as part of an LC call number is, however, preceded by a space, e.g., LB1043. A8 1973.

**Document type /DT*

The AGRICOLA record tags each item according to type of publication. There are three main categories established.

1. MONOGRAPH. This designation is given to cataloging records for monographs, separately cataloged monographs in a series, or analytics of monographs in series. The items in this category may be anything from 2-page pamphlets to multi-volume works.
2. ARTICLE. This designator is applied to indexing records for journal articles, indexed book chapters, or other portions of longer works that have been selected for indexing. Because of the high postings for this category, it should be used only in conjunction with other, more limiting terms; such as the following:

SS 2 /C?

USER:

PINK AND BOLLWORM AND ARTICLE /DT

3. SERIAL. This designator is given to cataloging records for items cataloged as serials. The term SERIAL AND-ed with a form of the name for a serial publication will separate the cataloging record for that item from all the indexing records for articles published in that serial. Thus, the entry IRCS /IT AND MEDICAL /IT AND SERIAL /DT would retrieve NAL's cataloging record for the *IRCS Journal of Medical Science*.

**File Segment /FS*

AGRICOLA records for items located in special subject collections are tagged for searching as a group. Presently ORBIT searches two special collections - the items input by the Food and Nutrition Information Center and the items input by the American Agricultural Economics Documentation Center. All FNIC items are tagged with FNC /FS, and all AAEDC items are tagged AGE/FS or AGC/FS for Canadian Agricultural economics material. To limit a subject search to FNIC items only, one would AND the subject terms with FNC, e.g., ALL PEANUT: AND FNC /FS.

**Foreign /FR*

Each record in the data base is tagged according to its language of publication. In addition, SDC tags each non-English record with the designator FOREIGN. By combining subject searches with AND NOT FOREIGN /FR or AND FOREIGN /FR, the user can easily limit his output to English or to non-English citations only. For example, 4 AND NOT FOREIGN /FR will limit the citations retrieved in Search Statement 4 to English language only. One caution, however, this logic will exclude some foreign citations which contain English summaries since only the original language of the article is considered in assigning language designators.

**Index Term /IT*

Items in this category are directly searchable in the Basic Index /BI category. For purposes of serial searching (stringsearch or sensesearch) the Title Word and Index Term categories are split.

The Index Term Category contains multi- and single-word entries for LC subject headings assigned to cataloging records. Subdivisions applied to subject headings are treated as additional subject terms. Thus the subject heading Marine Biology - Periodicals would be split into two subject term entries: MARINE BIOLOGY and PERIODICALS.

Single- and multiword subject headings for FNC and AGE items are also to be found in this category as are the geographic designators assigned by NAL staff (see section II-E for a complete list).

**Language /LA*

Each item in the AGRICOLA file is tagged according to language or publication (see section II-F for a complete listing of language codes). This ability to select items according to language can be useful when the patron wishes citations only in English, Spanish or Portuguese.

```
SS 8 /C?
USER:
7 AND NOT FOREIGN /FR
PROG:
SS 8 PSTG (37)
SS 9 /C?
USER:
8 OR 7 AND SPA /LA OR 7 AND POR /LA
PROG:
SS 9 PSTG (52)
```

NOTES /NO

The notes section of cataloging records in AGRICOLA can yield valuable information about special features of the items, such as bibliographies or English summaries; other descriptive information will also be found in this section. The example which follows illustrates how stringsearching the Notes category can identify foreign language monographs with English summaries.

```
SS 1 /C?
CATTLE AND FOREIGN /FR AND MONOGRAH /DT
PROG:
SS 1 PSTG (668)
SS 2 /C?
USER:
STRS / # : :ENG: AND :SUM:
PROG:
SS 2 PSTG (213)
```


**Organizational Source /OS*

This field contains the names of corporate authors or the corporate body from which a publication was issued. Although the indexing and cataloging sections at NAL attempt uniformity in the form of entry for corporate names, a good deal of variation will still be encountered by the searcher. Consequently, the searcher should either truncate his search terms or use the NEIGHBOR command to retrieve all entries from a given corporate body. For example, the user could enter:

```
SS 1 /C?
USER:
NBR CALIFORNIA AGRICULTURAL EXPERIMENT /OS
PROG:
POSTINGS      TERM
  1      CALIFORNIA (STATE) DEPT. OF PUBLIC HEAL/OS
  2      CALIFORNIA ACADEMY OF SCIENCES/OS
206      CALIFORNIA AGRICULTURAL EXPERIMENT S/OS
  6      CALIFORNIA AGRICULTURAL EXPERIMENT STAT/OS
  2      CALIFORNIA AGRICULTURAL EXTENSION SE/OS

UP N OR DOWN N?
```

or he could enter:

```
SS 1 /C?
USER:
ALL CALIF: /OS AND CITRUS
PROG:
SS 1 PSTG (20)
```

**Primary Category Code /PCC*

Each item in the data base is assigned at least one numerical subject classification code number (see section II-D for a complete list). This number - or the first number if more than one code has been assigned - is designated as the Primary Category Code. The second code number assigned to an item is designated as the Secondary Category Code.

Use of these subject category codes can relieve the user of having to input a long series of search terms in order to retrieve most relevant citations in a particular field. The category codes are especially helpful when other search qualifiers to be used are rather general. For instance, coupling general terms such as COST, BENEFIT and ECONOMICS with the category code 351000 will retrieve occurrences of the general terms in citations dealing with forest management.

Prior to 1972 a smaller and much broader list of subject categories was used by NAL. These categories do not overlap, and for complete coverage they should be used in addition to the newer code numbers. See section II-D for a list of the old category code numbers.

In using category codes the user should remember that these numbers are assigned at NAL primarily to indicate where the citation is to be published in a printed tool such as *Bibliography of Agriculture*. They should be used online, therefor, primarily to place retrieved items into a general context.

**Publication Date /PD*

**Publication Year /PY*

AGRICOLA records can be searched by date of publication of the source item. This date can be entered as year and month (/PD) or as a range of years or as the determinant in a GREATER THAN or LESS THAN qualifying phrase (/PY).

The examples below will illustrate use of this category.

SS 1 /C?

U.S. AGRICULTURAL RESEARCH SERVICE AND 1974 MAY

PROG:

SS 1 PSTG (6)

SS 2 /C?

USER:

STRIP AND ALL MIN: (IT) AND FROM 73 THRU 75

PROG:

SS 2 PSTG (45)

SS 3 /C?

USER:

ALL FLORIDA: AND RECREATION AND GREATER THAN 71

PROG:

SS 3 PSTG (4)

**Secondary Category Code /SCC*

Each AGRICOLA item is assigned one subject category code number and several items will receive double codes. These second subject code numbers are designated as Secondary Category Code items. Because any subject category code number can be assigned either as a Primary Code or as a Secondary Code, the user who desires to retrieve all occurrences of a particular code number must either specify both retrieval categories in his search statement or use truncation techniques. The two possible strategies would look like this:

SS 3 /C?

2 AND 601000 /PCC OR 2 AND 601000 /SCC

PROG:

SS 3 PSTG (158)

or

SS 3 /C?

2 AND ALL 601000:

PROG:

SS 3 PSTG (158)

Series Statement /SE

AGRICOLA cataloging records may contain series statements, added according to standard cataloging practice. This field is not directly searchable, so one of the serial searching techniques (stringsearch or sensearch) must be used.

**Source Name /SN*

The National Agricultural Library identifies for retrieval purposes documents from five sources: U.S. Department of Agriculture (USDA), Food and Agricultural Organization of the United Nations (FAO), State Agricultural Experiment stations (AG EXP), State Agricultural Extension Services (AG EXT), and complete translations of articles and reports (TRANS).

Source Reference /SO

The complete journal citation for articles and the imprint for monographic publications are indirectly searchable in the Source Reference category. Stringsearching this category can be difficult since most journal citations are entered only in abbreviated form. Title abbreviations follow the rules of the *American Standard for Periodical Title Abbreviations*, but the user should bear in mind that retrieval problems still exist because the abbreviation standards change.

When possible the user should set up an object statement for stringsearching that allows as much latitude as possible to the search program. For instance, a user wishing to limit a search to the *Southern Journal of Agricultural Economics* might create a stringsearch object statement similar to the following:

```
SS 8 /C?  
STRS /SO :SOUTH:J:AGR:ECON:
```

Title Word /TI

Individual words in titles and abstracts plus controlled single - or multi-word Index terms can be searched directly in the Basic Index field. Through serial searching techniques, the user can further restrict retrieval by searching words and phrases in the title specifically. For instance, a searcher may want to do a search for items specifically mentioning by-products of meat packing operations. Since "by" is a stop word, it cannot be searched directly, but it can be searched as part of a character string in a Stringsearch operation. Thus, STRS/TI/: BY # PRODUCT: would retrieve from a larger retrieval those items containing in their titles terms such as by product, by products, by-product, or by-products.

Translation /TR

NAL maintains a modest collection of translations of documents. When these items are entered into AGRICOLA, they are tagged by TRANSLATION AVAILABLE in the /TR category. This category can be searched by string - or sensearching techniques only.

Update /UP

Each AGRICOLA update tape can be searched individually through use of the Update retrieval category /UP. This capability can be particularly useful when the user wishes to update a search he has completed in the past. By replicating the search logic of the old search and then combining the results with appropriate update codes, the user can limit his printout to only items in the specified update tapes. For example, if a user wishes to update a search on orchidaceae he might use the following approach:

```
SS 1/C?
USER:
ORCHIDACEAE
PROG:
SS 1 PSTG (345)
SS 2/C?
USER:
1 AND 7506 /UP OR 1 AND 7505 /UP OR 1 AND 7504 /UP
PROG:
SS 2 PSTG (28)
```

E. SERIAL SEARCHING

ORBIT provides the user with the ability to search any AGRICOLA record character by character through its stringsearch or sentencesearch techniques. These text searching procedures allow the user 1) to identify useful information not retrievable through direct searching (recall that not all unit record categories are directly searchable), and 2) to eliminate "false positives" (items containing the desired search terms, but in the wrong sequence or in the wrong unit record categories). The format for entering serial searching statements is as follows:

```
STRS
  or + # of statement to + /Category to be + :Object string:
SENS      be searched      searched/
```

Stringsearch or Sentencesearch. Each serial search begins with either the word Stringsearch or Sensearch or their abbreviations STRS or SENS. Stringsearch (STRS) will cause the program to search for the characters in the object string anywhere within a unit record category. Sensearch (SENS) operates in the same manner as Stringsearch except that it will cause the program to search for the object string within a single sentence. A sentence is defined as any string of characters followed by a period and a space or the end of a unit record category.

Search Statement Number. The next element of a serial search statement is the number of the search statement to be searched. Only the number of the statement should be entered (e.g., STRS 3). If the statement number is not specified, the program will perform serial searching on the last completed search statement.

Searchable Category Qualifier. An abbreviation for the unit record category to be searched must be entered next, enclosed in diagonals, e.g., STRS 3 /AB/. If no qualifier is specified, the program will search for the object string in the title category. See section IV-D for a complete list of unit record category qualifiers for serial searching.

If the user wishes to have the same object string to be searched in more than one category, he must enter the abbreviations for each of the desired fields between diagonals, thus:

STRS 3 /AB,NO/ :BIBLIOGRAPH:

Object String. The last element of the serial search statement is the object string, the sequence of characters for which the program is to search. The string of characters is enclosed between colons, each representing from zero to the total number of characters in a unit record category. Colons may also be placed anywhere within an object string as well.

The examples which follow will illustrate how serial searching statements can be constructed.

STRS 4 (AB) : COST OF LIVING :

The phrase COST OF LIVING preceded and followed by a space in the abstract category will be retrieved.

STRS 3 (NO) :ENG: AND :SUM:

This statement will search the notes category for the strings ENG and SUM. This logic would retrieve the following notes:

ENG. SUM.
ENGLISH SUMMARY
ENGLISH SUMMARIES
SUMMARY IN ENGLISH

SENS 10 /TI,AB/ :MANAG:OBJECTIVE:

This statement will retrieve from the abstract or title a string of characters beginning with MANAG and followed by OBJECTIVE with from zero to many intervening letters, all within the same sentence. Some of the phrases that can be retrieved with this statement are:

MANAGEMENT BY OBJECTIVE
MANAGEMENT BY OBJECTIVES
MANAGING BY OBJECTIVES
MANAGEMENT OBJECTIVES

STRS 6 (AB) :MEAN BY # PRODUCTS:

This single variable character key (NO.) is used so that alternate spellings of the object term will be retrieved -- BY PRODUCTS or BY-PRODUCTS.

Stringsearching or sentencesearching are relatively slow and time consuming procedures. The ORBIT program, consequently, is set up to process the serial searches in several different time segments, each segment varying in length depending on the number of users on the system. After

each time segment, the program reports the number of items it has searched and the number of items meeting the search specifications. The user is then asked whether he wishes the search to continue. If the user says yes, the program will search another portion of the search statement and report the new results. If the user says no, or if the entire search statement has been processed, the program will report the number of postings in the next search statement of the current sequence. The following series of statements will illustrate:

SS 10 /C?	The Notes field of statement 9
USER:	is to be searched for the string
STRS 9 /NO/ : BIBLIOG:	BIBLIOG.
PROG:	
(97) SCHD (32) QUAL; CONT? (Y/N)	
USER:	Partial results are reported and
Y	user responds that the search
PROG:	is to continue.
(215) SCHD (79) QUAL; CONT? (Y/N)	
USER:	
Y	
PROG:	
SS 10 PSTG (97)	Final result of 97 postings reported.

Because serial searching is so time consuming, the user should try all possible direct searching techniques to limit his search output before attempting to conduct a serial search so that as few items as possible are searched character by character.

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SECTION V. BIBLIOGRAPHIC RETRIEVAL SERVICES (BRS) SEARCHING

A. SYSTEM PROTOCOLS

SYSTEM CLUES

One may log into the searching system of Bibliographic Retrieval Services either through direct dial long distance telephone or through the TELENET communications network. With most terminals once a searcher has successfully completed logging into the system, the BRS computer will indicate that it is ready to be used by one of two cues: an arrow and colon (← :) or an underscore and a colon (_ :). The system will not accept input until it has cued the user that it is ready.

MESSAGES TO THE SYSTEM

After the computer has given a cue, the user may enter either a search statement, one of the several BRS commands, or respond to an instruction from the system. In the search mode the user may enter the terms required by the search strategy directly. Search statements may consist of single terms or os terms and previous search statement numbers linked by Boolean logical operators (OR, AND, NOT). Normal spacing should be used in entering terms. Terms may be entered without qualification, in which case occurrences of that term in any searchable field will be retrieved; or terms may be entered with specification as to what fields are acceptable. Each of the following entries illustrates a properly formulated search query:

1_ : ENERGY

or

1_ : SOLAR AND ENERGY

or

1_ : 5510.CC. AND GREENHOUSES. TI.

or

1_ : 2 AND (PECAN OR PECANS OR WALNUT OR WALNUTS)

Multiple search terms which the user desires to join with the OR logical operator may also be entered as a continuous string. For example, the terms defining the concept "swine" could be entered in either of the following ways:

1_ : SWINE OR HOG\$1 OR PIG\$1 OR PIGLET\$1 OR SOW\$1 OR BOAR\$1 OR
GILT\$1 OR SHOAT\$1 OR PORCINE

or

1_ : SWINE HOG\$1 PIGLET\$1 SOW\$1 BOAR\$1 GILT\$1 SHOAT\$1 PORCINE

This example illustrates quite well that search statements can be quite long in BRS (up to 234 characters or spaces) and can occupy several lines.

This example also illustrates that BRS allows searchers to use variable truncation in entering terms. The format for truncation is to place a dollar sign (\$) immediately after the stem letters. If not further qualified, such an entry would cause the computer to look for all terms beginning with that group of letters, regardless how many characters followed the stem. Thus, when the term PIG\$ is entered, the system searches for PIG, PIGS, PIGLET, and PIGLETS as well as for terms such as PIGWEED and PIGMENTS. The user can, however, be more specific in formulating truncated search terms, as was illustrated by entries such as SOW\$1. There the numeral following the dollar sign indicates the maximum acceptable number of letters after the stem; thus SOW\$1 would retrieve terms such as SOW or SOWS but not terms such as SOWING OR SOWBUGS.

The BRS system also has a built-in limitation on its truncation capabilities. For any truncated entry the system will search only the first hundred terms beginning with that stem. In responding to a search statement which exceeds this limitation, the system warns the user that the results it is reporting are generated by only the first 100 terms. To illustrate, let us say that the user has entered the following:

1_: (WOMAN OR WOMEN) AND AGRICULTUR\$

In response to such a command the system prints out the following message:

E1417 TOO MANY WORDS FOR AGRICULTUR\$ QUERY ACCEPTED WITH
WORDS AND COUNTS FOR TERMS ONLY AS BEFORE THE OVERFLOW.

RESULT 99

As one can see from this response, the system will try to provide an answer to the query even though it may not, in fact, have searched everything desired by the user.

CORRECTING TYPOGRAPHICAL ERRORS

Typing errors can be corrected in either of two ways before the message is sent to the BRS computer. Character-by-character corrections can be accomplished by simply backspacing the appropriate number of spaces and then typing in the correction. An entire line can be deleted by entering a question mark (?) and a carriage return at any point in the line of print.

MESSAGES FROM THE SYSTEM

In response to messages from the user the BRS computer will send back either the desired RESULT statements, questions, or other output, or it will respond with one of several dozen error messages. A detailed explanation of BRS error messages and appropriate corrective responses can be found in APPENDIX I to the *BRS System Reference Manual*.

B. SEARCHING SEQUENCE

Once the search analyst has entered the appropriate identification codes and passwords, the BRS computer responds with the following messages:

SIGN ON IS COMPLETE

ENTER YES IF BROADCAST MSG IS DESIRED

If this is the first time that the system has been used during the week, it is advisable to request the system messages, otherwise the searcher should simply depress the carriage return or send key to bypass the broadcast messages. The system will then respond:

ENTER DATA BASE NAME

_:

At this point the searcher types in CAIN and a carriage return. The system responds with *SIGN-ON plus the time in the Eastern time zone, connects the user to the AGRICOLA database and switches to the search mode. The response is this:

BRS — SEARCH MODE — ENTER QUERY

1_:

While in the search mode the search analyst can generate up to 999 statements, each of which can be up to 234 characters long and can consist of several combinations of individual terms. In order to enter or combine terms in the search mode, the user need only type in the desired terms or term combinations. To illustrate, let us say that the analyst is conducting a search on marketing of major citrus crops. A search on this topic might go like this:

1_ : CITRUS OR ORANGES\$1 OR LEMON\$1 OR TANGERINES\$1 OR
GRAPEFRUIT\$1

RESULT 3009

2_ : 1 AND (MARKET \$ OR SELLS OR RETAIL\$ OR WHOLESALS OR
MERCHANDIS\$)

RESULT 149

The search analyst then decides that results should be further refined by limiting retrieval to English language materials. The LIMIT command is used to accomplish this task, thus:

3_ : ..LIMIT/2 LG=EN

RESULT 000124

At this point the searcher may want to look at a few of the items being retrieved in order to check their relevance to the topic, so the PRINT command is employed as is illustrated here:

4_ : ..PRINT 3 TI/DOC=1,3

This command shifts the system into the online printing mode and instructs it to print out the titles of the first three documents in the search statement immediately preceding. If that sample appears satisfactory, the search analyst may decide to have the entire group of references printed offline and mailed. These instructions take the following form:

_ : ..PRINTOFF P(ALL) DOC(1,124) ID(JONES/CITRUS)

Such a command means, "Print offline the results of the last search statement. Records 1 through 124 are to be printed, and they are to contain all paragraphs of the unit record. The printout is to bear the identification tag 'JONES/CITRUS.' " The system will respond with a unique identification number such as Q0004.

The search completed, the analyst then enters the command . . OFF. the BRS system responds:

```
CONNECT TIME          0:09 HH:MM****
*SIGN-OFF  17.22.35          07/10/78
```

At this point the searcher hangs up the telephone and the process is finished.

C. BRS COMMANDS

The modified STAIRS computer program used by BRS operates on fourteen different commands. Some commands such as SEARCH or PRINT place the system into a particular mode of operation, while other commands such as SAVE perform specific functions without affecting the system's overall mode of operation. Regardless which command is being employed, it must be preceded immediately by double periods, thus: . .SEARCH, . .LIMIT, . .TIME, etc. The various commands, their required formats, and their uses are explained in this section.

BRS COMMANDS SUMMARY

COMMAND	FUNCTIONS	SAMPLE ENTRIES
CHANGE	Allows searcher to shift to other BRS databases, reports elapsed time, and erases previous search history.	..CHANGE ..CHANGE/CAIN ..CHANGE/ERIC
DISPLAY	Produces summary of search history of all sets already created or of individual groups of sets.	..DISPLAY ..DISPLAY ALL ..DISPLAY 8,15
EXEC	Causes to be reexecuted any search strategies which the user has stored away for future reference with the SAVE command.	..EXEC A123 ..EXEC TREE
LIMIT	Allows searcher to impose specific limitations on sets created while in the search mode.	..LIMIT/3 SN=USD ..LIMIT/3 YR WL 76,78 ..LIMIT/3 LG=EN AND YR GT 75
OFF	Terminates the searching session, reports the time elapsed since sign-on, and disconnects user from the BRS system.	..OFF

COMMANDS SUMMARY, CONTINUED

COMMANDS	FUNCTIONS	SAMPLE ENTRIES
PRINT	Allows searcher to view online all or part of the references retrieved during a search.	..PRINT ..PRINT 3 TI/DOC=1,10 ..PRINT 5 ALL/DOC=ALL
PRINTOFF	Allows searcher to request offline printing of specific groups of documents retrieved during an online session.	..PRINTOFF ..PRINTOFF P(ALL) DOC(ALL) ID(ASHE)
PURGE	Allows user to erase from temporary or long-term storage any statements, commands, or strategies entered under his password.	..PURGE ALL ..PURGE Q0004 . PURGE PS(CHEM)
SAVE	Allows user to store search strategies for execution at a later time.	..SAVE A123 ..SAVE PS(BUGS)
SDI	Allows user to enter search logic for periodic current awareness updating by BRS.	..SDI P(AU,TI,SO) ID(JONES)
SEARCH	Places the BRS system into the searching mode which allows user to enter and combine elements of his search strategy. Once in this mode, the user simply enters desired terms and term combinations.	..SEARCH RICE OR ORYZA AND SATIVA 1 AND2515.CC.
SEARCHOFF	Allows user to have a strategy executed against an offline portion of the database.	..SEARCHOFF YR(7074) P(ALL) DOC(ALL) ID(KUNZE)
SET DETAIL	Allows user to request the BRS system to respond with postings to each term entered in a search statement.	..SET DETAIL=ON ..SET DETAIL=OFF

CHANGE

At sign-on the BRS system asks the searcher to specify the name of the database to be searched. At any time during the session, however, the searcher can switch to any of the other BRS databases through use of the CHANGE command. Format for the command is: . . CHANGE/XXXX, where the X's represent a four-letter identification label for the file. The labels are as follows:

AGRICOLA=CAIN	INSPEC=INSP
BIOSIS Previews=BIOL	MEDLARS=MESH
CA Condensates=CHEM	NTIS=NTIS
Cumulative Dissertation	Pollution Abstracts=POLL
Index=DISS	Psychological
ERIC=ERIC	Abstracts=PSYC
ABI/INFORM=INFO	

A CHANGE command will cause the system to report the elapsed time on the database which the user has been searching and will purge all statements in the search register and start the user afresh in the search mode in the new database. The example which follows illustrates how a CHANGE command works.

```
4_: 3 AND 2515.CC.

RESULT                                15
5_: . .PRINT 4 AU, TI,SO/DOC=ALL

      (those references are printed out) . . .

_: . .CHANGE/BIOL

CONNECT TIME          0:10 HH:MM****

BRS - SEARCH MODE - ENTER QUERY
```

DISPLAY

During the course of a search the user may desire a recap of the search statements which have been created. This summary can be produced by entering the DISPLAY command. Several options are open in using this command. Entering . .DISPLAY alone produces a recap of the last search statement created. The entire set of statements can be produced with . .DISPLAY ALL. Selected sets can be requested by entering their numbers as part of the command. . .DISPLAY 3, for instance, will cause only statement 3 to be displayed, while . .DISPLAY 8,15 will result in a display of sets 8 through 15. The following series of statements will illustrate how the DISPLAY command works.

```
BRS - SEARCH MODE - ENTER QUERY

1_:  RURAL AND DEVELOPMENT

RESULT                                1026
2_: . .LIMIT/1 LG=EN

RESULT                                000581
00003_: . .LIMIT/2 YR GT 76
```



```

RESULT                                000106
00004_: . .DISPLAY ALL

SEARCH -- QUERY

00001  RURAL AND DEVELOPMENT

      NUMBER OF OCCURRENCES=001026  NUMBER OF DOCUMENTS=001026

SELECT -- QUERY

00002  1 LG=EN

      NUMBER OF OCCURRENCES=000581  NUMBER OF DOCUMENTS=000581

SELECT -- QUERY

00003  2 YR GT 76

      NUMBER OF OCCURENCES=000106  NUMBER OF DOCUMENTS=000106

*****END OF DISPLAY, RETURN TO CONTINUE*****

```

EXEC

The BRS system allows the user to save search strategies for re-execution at a later time in the same database or against another database. Once a strategy has been saved, the EXEC command is used to effect its re-execution. At the time a search is saved the user assigns a four-character alphanumeric label to identify the strategy and with which the statements are recalled and reprocessed. The format for the command is simply .EXEC plus the label, thus: .EXEC WEED. After reprocessing, each statement of the search strategy can be accessed for printing or for combination with other search elements.

There is one condition which must be observed, however, in using the EXEC command. This function must be performed at the first of a search, that is, at statement 1. If the command is entered at any other time, the system will respond with an error message.

LIMIT

The combinations of terms in the search mode enable the user to narrow his computer retrieval by subject or by any of a number of directly searchable categories. Greater refinement of the output can be effected with the LIMIT command. In the AGRICOLA database the following fields can be used with this command: SN (agency source code or subfile of the database), YR (year of publication) LG (Language), and PT (publication type). Consult the next section of this chapter for specific details on each of these fields.

This command must be used on a subset of the file; that is, the user must first retrieve documents by entering and combining terms in the search mode. The LIMIT command can then be used to narrow these results further.

The format for the LIMIT command is as follows:

. . LIMIT/set # plus field designators and criteria

The criteria for each of the fields used in this command can be delimited with the following operators:

EQ (=)	equals	GT (>)	greater than
NE	not equal	WL	within the limits of
LT (<)	less than	OL	outside the limits of

Let us assume that at statement 3 the user has retrieved a set of 250 citations. The following sequence of steps will illustrate how this set can be further refined with LIMIT:

```
4_: . . LIMIT/3 LG=EN

RESULT          000197
00005_: . . LIMIT/4 YR GT 76

RESULT          000079
```

Boolean operators can also be used in the LIMIT command, so the previous result can, in fact, be accomplished in one step, thus:

```
4_: . . LIMIT/3 LG=EN AND YR GT 76

RESULT          000079
```

OFF

After the user has completed the steps of his search, he can sign-off the BRS system by using the OFF command. In response to the entry . . OFF, the system prints out the amount of connect time elapsed on the database rounded to the nearest minute, the time of day, and the date.

PRINT

The PRINT command is used in order to view online items retrieved while in the search or the limit modes. In order for the BRS system to be able to respond to the PRINT command, it must be instructed which unit record paragraphs and which documents are to be printed. This information can be entered in step-wise fashion, with the BRS system prompting the searcher for each piece of required data as illustrated below:

```
5_: . . PRINT

BRS -- PRINT MODE -- SPECIFY PARAGRAPHS
ALL

RO521 * SPECIFY DOCUMENTS
DOC=ALL
```

Greater efficiency of online time can be achieved, however, by entering this information in one statement, thus:

```
5_: . . PRINT 4 AU,TI,SO/DOC=ALL
```

When using the shortcut method the searcher must be sure to specify which search statement is to be printed. As the preceding example illustrates, the searcher can either request all paragraphs to be printed or he can select individual paragraphs. The relevant fields for a complete bibliographic citation can be chosen for printing by entering simply BIBL in this part of the command.

Fewer than an entire set of documents can likewise be specified. If a single citation is desired, merely enter the number of that document. An unbroken range of documents can be requested for printing by entering the numbers of the desired items, separated by a hyphen (DOC=1-5 to get items 1 through 5 printed at one time). Non-consecutive documents can be requested for printing by entering the item numbers separated by commas; thus, in order to print items 1, 3, and 5 the searcher would enter DOC=1,3,5.

PRINTOFF

The PRINT command is used only when the search analyst desires printing at his terminal. Larger printing tasks can be ordered for offline printing by BRS with the PRINTOFF command. Like its online counterpart, this command also needs explicit instructions as to which documents and paragraphs to print. In addition, PRINTOFF requires a printout identification tag and a statement number if output is to be from any search statement other than the last one in the strategy. This example illustrates all these features:

```
10_: . . PRINTOFF ST(7) P(AU*TI*SO) DOC(ALL) ID(JONES/BIOLOGY)
```

It interprets, "Print offline all documents from search statement 7. The author, title, and source reference paragraphs are to be printed, and the printout is to be labelled 'JONES/BIOLOGY.' "

In response to this command the BRS system assigns a unique identification number. This number can be used later during the day if the searcher decides that he wishes to purge the command before the documents are printed at the end of the day.

PURGE

The PURGE command can be used to cancel previously stored commands or to erase search statements no longer needed during an online session. Several functions in the BRS are performed at a time later than that of initial input, notably SDI, SEARCHOFF, and PRINTOFF. The PURGE command enables the searcher to cancel any of these previously entered commands. At the time SDI, SEARCHOFF, or PRINTOFF commands are entered, the BRS system reports to the user an alphanumeric tag with which to identify the strategy, such as Q0001. To effect the purging of any of these commands the user enters . . PURGE plus the identification number, e.g., . . PURGE Q0001. Before the system will actually erase a strategy, it will print out information to enable the searcher to verify the correctness of the request. The following sequence illustrates the PURGE command in action:

```
3_: . . PURGE Q0001
```

```
QUERY 0001 SEARCHOFF  
ID=JONES, EE
```

```
RETURN TO CONFIRM DELETE OR ENTER NEW COMMAND TO ABORT  
(user enters carriage return)
```

```
14610 * SAVED QUERIES HAVE BEEN PURGED
```


In the course of an online session, the searcher may wish to erase some earlier statements that are no longer needed in the strategy. PURGE also performs this useful function. Entry of . . PURGE alone will cause the last statement to be erased. Any other individual statement or sequence of statements can likewise be erased by entering numbers in conjunction with the command name. For example, . . PURGE 8 will cause only statement 8 to be erased, while . . PURGE 4,15 will cause statements 4 through 15 to be purged. Similarly, the entire search history can be erased by entering . . PURGE ALL.

Finally, PURGE can also be used to erase any search strategies which have been sorted away online with the SAVE command. Temporary saves really do not need to be erased since at this time the BRS system automatically erases any temporary saves at the end of the day. Permanent saves, on the other hand, must be erased by the searcher once they are no longer needed. In order to purge a saved search, the user simply enters the command plus the label he created at the time the strategy was stored. For example, . . PURGE PS(AGRI) will erase a strategy saved for longtime storage under the label PS(AGRI).

SAVE

Search strategies may need to be run against several databases for thorough coverage of a topic. On other occasions the user may wish to store away a strategy for re-execution at a later date. These functions can be accomplished with the SAVE command. There are two types of saves in the BRS system: Temporary saves can retain a search strategy during the day in which they are entered, while permanent saves will store a logic in the computer indefinitely, to be re-executed on demand at any time. Both types of saves are very much alike in format: the temporary save is effected by entering . . SAVE XXXX where the four X's stand for some searcher chosen identification tag. This tag can be any string of alphabetic and/or numeric characters. Permanent saves can be entered in a similar fashion except that the identification tag is enclosed in parentheses and is preceded by "PS", thus: . . SAVE PS(XXXX). Once saved, the strategies can be recalled into the active search register with the EXEC command in conjunction with the identification tag. In this way . . EXEC PS(TREE) will re-execute a strategy stored away permanently under the tag PS(TREE). Each statement in the strategy will be re-executed and may be accessed in the new search.

SDI

In addition to on-demand retrospective searches via the BRS online system, the user may wish to provide selective dissemination of information (SDI) to patrons. By skillful use of the SAVE search capability of BRS it is possible for the user to provide such a service, but the logistics of providing regular current awareness printouts by this technique may get tedious, especially if there are a large number of profiles to be run.

The BRS system provides automatic SDI capability to its users via the SDI command. This command requires that after the desired strategy has been entered, the user specify the paragraphs to be printed and provide an identification label. This example will illustrate:

```
1_: (DAIRY OR DAIRIES OR DAIRYING) AND GOATS$1
```

```
RESULT 38
```

```
2_: . . LIMIT/1 LG=EN
```

```
RESULT 00030
```

```
00003_: . . SDI P(ALL) ID(DYAL, D)
```

```
YOUR QUERY HAS BEEN SAVED UNDER THE NAME Q0031
```

The tag printed out in response to the command---Q0031---should be recorded for future reference in the event that the profile is to be purged from the system at some future time. Until it is purged the profile will be automatically run against each monthly update of the database on which it was entered.

SEARCH

The greatest proportion of online time in the BRS system will probably be spent in the search mode. It is in this mode that search terms are entered and combined; other commands such as LIMIT, PRINT, PRINTOFF, etc., generally "fine tune" or otherwise manipulate the results that are achieved while in this mode. At sign-on the BRS computer automatically places the user in this mode until he chooses some other function (such as printing).

While in the search mode the BRS system is set to retrieve items and combine terms in a number of different ways. Generally speaking, terms are entered in a conversational manner; that is, the user simply types in the terms he desires the system to search for. For example,

1_: WHEAT OR TRITICUM OR TRITICALE

Statements may contain numerous terms and may, in fact, contain several Boolean operators. Because of the hierarchy followed in performing logical operations (AND's and NOT's first and then OR's) the user entering a complex search would be well advised either to break the search into simple elements in different statements or to group ideas algebraically with parentheses in order to insure that the system understands his intended logic. Let us look at the following sequence as an illustration:

1_ : (ERWINIA AND AMYLOVORA) OR (FIRE AND BLIGHT) OR FIREBLIGHT

RESULT 126
2_ : ERWINIA AND AMYLOVORA

RESULT 112
3_ : FIRE AND BLIGHT

RESULT 86
4_ : FIREBLIGHT

RESULT 15
5_ : 2 OR 3 OR 4

RESULT 126

A search such as that just outlined will produce results for terms appearing in any of the directly searchable paragraphs of the AGRICOLA unit record, that is, author, author affiliation, title, call number, category codes, descriptors, or abstracts. More specific searching can be done, however, if the user chooses to qualify the terms being searched. In order to qualify a search term the user must designate which fields are to be included or excluded from the search. Fields are designated by appending between periods the appropriate two-letter labels. For instance, EXPERIMENT. TI. would produce a set of references in which the term EXPERIMENT appeared in the title and would avoid many extraneous references in which that word appeared as part of

the author affiliation paragraph (e.g., Texas Agricultural Experiment Station). More than one field may be designated in this manner; thus, DIET.TI,AB,DE. would retrieve references containing the word DIET as part of the title, abstract, or descriptor fields only.

In order to exclude fields from searching, the user simply adds an extra period at the beginning of the designator. To use the example above, EXPERIMENT . . IN. would retrieve all occurrences of EXPERIMENT in any of the searchable fields with the exception of the author affiliation paragraph. This feature may be particularly useful when there is a single word in the strategy which might also be the last name of a person, such as Pine, Fish, Wood, Woods, Small, etc. By entering the term with negative qualification excluding the author field, problems can frequently be avoided; thus, PINE . . AU. would create a set of reference in which PINE was a subject-related term but would avoid retrieving items on pesticides by George F. Pine.

Occasionally, the user may find himself in a quandary as to what forms of a given word may exist in the database. If he wishes to get a display of terms beginning with a given stem in the file, all that he need do is enter ROOT plus the desired word stem. For example, ROOT PEST will cause to be produced a list of terms in the database beginning with the letters PEST--pest, pests, pesticide, etc. Up to 100 terms will be printed out for any given stem. If more than 100 exist in the file, the system will print out the first 100 and indicate that there are more still in the file which have not been displayed. The ROOT feature merely displays the possible search terms which might be used and does not produce a set containing those references. In order to create a set, the terms would then have to be entered.

Word Relationship Searching. Up to this point the examples which have been used have been simply for searches utilizing the Boolean logical operators OR, AND, and NOT which function generally to retrieve documents based on the physical co-occurrence of terms within a document. These operators do not take into account in most instances that one term might be in the title and another in the abstract, nor do they necessarily guarantee that terms are in any particular order. BRS allows the user to be more specific in the requests he makes of the system by making available three additional operators--SAME WITH, and ADJ. The SAME operator indicates to the system that the terms entered are to be within the same paragraph of the record; that is, both terms must be within the title or both must be in the abstract. No word order is implied, however. WITH indicates to the system that not only must both terms be in the same paragraph but they must also be within the same sentence. Again, no word order is implied. Finally, the ADJ operator retrieves items that are within the same paragraph and sentence and in addition are in the order specified by the searcher. To illustrate this feature let us take the words NEIL and GEORGE. A search consisting of NEIL AND GEORGE could retrieve items in which any of these words showed up anywhere in the citation--"George Fukuma, 1902-1974, Horticulturist" by M. Neil, for example. NEIL SAME GEORGE would insist that both words be in the same paragraph, probably the author paragraph in this example. But this search could retrieve an item co-authored by S. E. Neil and M. F. George. NEIL WITH GEORGE is more specific and insists that both terms be in the same sentence (in AGRICOLA each individual author is treated as a separate sentence). Here there could still be some ambiguity since there could be entries for Neil George or for George Neil. Finally, ADJ allows the user the greatest specificity by allowing him to indicate the word order he is looking for, thus NEIL ADJ GEORGE would retrieve only references in which the author's name in inverted order was Neil, George.

SEARCHOFF

The BRS system maintains only a portion of the AGRICOLA database actually online; the

remainder of the file (1970-1974) is searchable in the offline mode with the SEARCHOFF command. The format for this command is as follows:

. . SEARCHOFF YR () P () DOC () ID ()

The YR element specifies the year or years to be searched. A search of a single year requires just that year to be entered, e. g., YR (1970) or YR (70). To search an unbroken sequence of years enter the significant digits run together, e.g., YR (7074). Non-consecutive years can be specified in this manner: YR (70,73).

The paragraphs to be printed are specified by the P () element. P (ALL) will have all paragraphs printed; individual paragraphs can also be selected by entering the labels for the desired elements, e. g., P (AU, TI, SO, YR). Entering P (D) will have printed a predetermined group of paragraphs from the unit record. In AGRICOLA this default mode is accession number, author, title, source and year.

The DOC () element specifies the documents which are to be printed. DOC (ALL) will print all items retrieved by the search; remember that at the time SEARCHOFF is entered, you will know how many items will have been retrieved. An upper limit for printing can be specified by putting in the number range of documents. For example, DOC (1,50) will have the first 50 items printed, regardless the actual number of items retrieved. The limit here applies to the retrieval from each year; so if three years were searched offline, potentially 150 items would be printed if DOC (1,50) were specified.

Finally, the SEARCHOFF command asks for an identifying label for the printout, such as ID (JONES, JE). Printouts will be sorted by the information in this element, so the end user's last name will probably be the best choice for a label.

Unless otherwise instructed, the SEARCHOFF command will print results only from the last statement in the strategy. An optional element--ST () --- allows the user to select some other statement in the strategy for printing. For example, although a searcher may complete six statements before entering a SEARCHOFF, he may decide that he really desires to have printed the results of statement three. Entering ST (3) as part of the command will accomplish this result.

SET DETAIL

The SET DETAIL command allows the searcher to select the amount of information reported by the BRS systems in response to search statements. Normally, the BRS system operates with the Set Detail off and responds to a search statement with a single number indicating the composite answer to the request. For example, the usual response in BRS looks like this:

1_: CITRUS AND ECONOMICS

RESULT 15

If the user desires to know how many documents are retrieved by each term in the strategy in addition to the final result, he can enter . . SET DETAIL=ON. The system will then respond with postings for each term in the strategy, thus:

1_: . . SET DETAIL=ON

1_: CITRUS AND ECONOMICS

CITRUS
ECONOMICS
RESULTS

391 DOCUMENTS
3812 DOCUMENTS
15 DOCUMENTS

Note that the number of documents actually retrieved by the statement is the same as in the earlier example. The other postings notations are for information only. One caution should be observed in use of this command. Once the Set Detail has been set for ON, individual responses will be given not only for terms in search strategy but also for each term retrieved through a truncated entry, so use of truncation with the Set Detail turned on should be approached with care.

TIME

The TIME command enables the searcher to ascertain the amount of time elapsed on a search. Each entry of this command will result in the system's reporting the cumulative amount of time elapsed on the database since sign-on or since the last CHANGE command was entered. The time reported will be rounded to the nearest minute.

D. RETRIEVAL CODES

The AGRICOLA record as it is formatted for searching on the BRS system consists of up to 15 different elements, or paragraphs. These elements are summarized in the table and the sections which follow. Bear in mind that not all of the fields in the BRS version of the AGRICOLA record can be used to retrieve references, and others, such as language, can be used only in limiting subsets of the database which have been retrieved by use of other unit record elements.

BRS RETRIEVAL CODE SUMMARY

(* = Limit only, + = Display only)

CODE	DESCRIPTION	SAMPLE ENTRIES
AB	Abstract	(SCHOOL ADJ LUNCH).AB.
AN+	Accession number	AN 77003865
AU	Authors (both individuals and organizations)	JONES ADJ E ADJ F JACKSON ADJ SAMUEL ADJ R ROHM.AU. WITH HAAS.AU.
CC	Category Codes	3010.CC. AND CATTLE HOUSEPLANTS AND 10\$2.CC.
CN	Call number of item	WIND AND HD9502\$ SOIL AND SB4335B6
DE	Descriptors	COMMODITY ADJ MARKETS.DE. FOOD ADJ PURCHASING.DE.
IN	Author affiliation	(TEXAS WITH AGRICULTURAL).IN. (FOOD WITH AGRICULTURAL WITH ORGANIZATION).IN.
LG*	Language of publication	..LIMIT/3 LG=EN ..LIMIT/3 LG=GE AND YR GT 1976
NT+	Notes	NT SUMMARY IN ENGLISH
PT*	Publication type	..LIMIT/3 PT=M ..LIMIT/3 PT=J AND YR=1978

BRS RETRIEVAL CODE SUMMARY
CONTINUED

CODE	DESCRIPTION	SAMPLE ENTRIES
SN*	Source code for special categories of records or items issued by selected agencies	..LIMIT/6 SN=USD ..LIMIT/6 SN=FNC ..LIMIT/6 SN=TRN
SO+	Source reference	SO BONSAI J. 9(1):14. SPRING 1975.
TI	Title	(CITRUS WITH DISEASE\$1).TI.
TR+	Foreign title	TR LA PROPAGATION DES FRAMBOISES
YR*	Year of publication	..LIMIT/18 YR=77 ..LIMIT/21 YR WL 73,78

ABSTRACT

AB

Individual words within the abstracts of FNIC and AGECON records are searchable with the BRS system. Note that naturally occurring punctuation, such as hyphens, is retained when AGRICOLA records are loaded. Therefore, in order to insure complete retrieval on some concepts several alternative formulations must be used. For example, to search for information on the Meals On Wheels program for the elderly one should enter:

1_: MEALS ADJ WHEELS OR MEALS-ON-WHEELS

ACCESSION NUMBER

AN

Each record in the AGRICOLA database is assigned an eight-digit record number consisting of the two digits for the year in which the record was created plus six more digits identifying the record. This element cannot be used in formulating search strategies, but it can be useful to the searcher who must arbitrarily limit his search results. By noting the accession number of records, he can judge how recent is the information at a particular point in a search printout and can then establish a cutoff point for the output.

AUTHORS

AU

The names of both personal authors and corporate bodies are entered in this unit record field and can be searched as individual words. The format for personal names is always last name followed by a comma and either the full given names or initials; thus, George F. Zimmer could be represented in the database in the following manner:

ZIMMER, GEORGE FREDERICK
ZIMMER, G F
ZIMMER, GEORGE F, and so forth.

Each word or initial in a name is searchable; so in order to retrieve works by Mr. Zimmer, for example, one should enter:

ZIMMER ADJ (G OR GEORGE) ADJ (F OR FREDERICK)

This strategy will allow for retrieval of works by this author, regardless the form of entry used for his name.

The variability which exists in corporate names also necessitates a flexible search strategy. Thus, in order to be assured of retrieving publications by the California State Department of Health, as an example, one should employ a strategy similar to this:

CALIF\$ WITH (DEPARTMENT OR DEPT) WITH HEALTH.

CATEGORY CODES

CC

The indexers and catalogers who prepare records for AGRICOLA assign one, and occasionally two, numeric subject codes to each item. These codes are directly searchable and can often be valuable in putting lists of references into a particular context. For example, TOMATO\$2 AND 10\$2 will retrieve citations on marketing and economics of tomatoes. Four different sequences of codes have been used since AGRICOLA was created: AGECON's four-digit codes were used until 1976; a series of broad two-digit codes were used until 1972 by NAL, and two sets of four-digit codes--NAL's and FNIC's--are still in use.

In using codes the searcher needs to remember two things. First, the codes are assigned primarily to establish a context for the item, not to draw out specific details. Second, some of the AGECON and FNIC categories overlap NAL codes with slightly different meanings; so an analyst desiring to search only codes with FNIC's meanings, for example, should also LIMIT any direct search results to those tagged SN=FNC.

CALL NUMBER

CN

For most records in the AGRICOLA database the NAL call number is a searchable element. A few early records input by the University of California at Davis and a few AGECON records will contain other call numbers or accession numbers in this field. The BRS system removes all punctuation from numbers in this field for searching. Thus, in order to retrieve items with the call number SB433.5.B6, one will have to enter SB4335B6. The missing decimals in classification numbers may occasionally pose a problem to the user wishing to use these numbers as subject parameters since, for instance, the distinction is lost between Z699.5 and Z6995. Such occurrences should, however, be rare.

DESCRIPTORS

DE

Any AGRICOLA records may have terms entered in the descriptor field. Records prepared by FNIC, AGECON, and the NAL Cataloging Section will always contain terms drawn from their respective controlled vocabulary authority lists. Those records created by the NAL Indexing Section may also contain geographic descriptors drawn from the list in Section II of this manual. NAL Indexers also use this field to note review articles and items with lengthy bibliographies. Descriptors can be searched only by individual words; so the searcher desiring the two-word descriptor CONSUMER BEHAVIOR would enter CONSUMER ADJ BEHAVIOR.DE.

AUTHOR AFFILIATION

IN

Many records--particularly those for items sponsored, issued, or published by the U.S. Department of Agriculture, or the state experiment stations and extension services--will contain the author affiliation field. Because each word in this field is searchable, the searcher must

remember to allow for the possibility of variant forms such as DEPARTMENT or DEPT.

LANGUAGE

LA

Each AGRICOLA record is tagged to indicate its language of publication. References identified via direct searching techniques can be further limited to specific languages with the LIMIT command, thus:

1_: TOMATOS AND 10\$2.CC.

RESULT 170

2_: . . LIMIT/1 LG=EN

RESULT 000138

If foreign language items were desired, the searcher would enter:

2_: . . LIMIT/1 LG NE EN (i.e., language not equal to English)

BRS has standardized all language designators in the system to two--character codes; these codes are indicated in brackets in the language code portion of Section II of the manual.

NOTES

NT

Many cataloging records and a few records from other units will contain informative notes. The type information to be found in this field ranges from references to substantial bibliographic lists to indications that the item contains a summary in another language. Although this element is printed as part of a full record, it cannot be searched as part of a retrieval strategy.

PUBLICATION TYPE

PT

AGRICOLA records are tagged either as articles (J), monographs (M), or series (S). Search results from directly searchable fields can be narrowed to these document types with the LIMIT command. PT=J will retrieve references both to journal articles and to parts of larger works (e.g., chapters from significant books or papers from published proceedings). PT=S will retrieve serial cataloging records and serial analytics done by the NAL Cataloging Section.

SOURCE NAME

SN

Several types of publications can be identified with three--character codes via the LIMIT command. These codes are used to identify both items issued by particular groups and records in specific collections. The codes are as follows:

Publication sources

USD	USDA publications
EXP	State agricultural experiment station publications
EXT	State agricultural extension service publications
FAO	Food and Agricultural Organization publications
666	Other U.S. publications

Collection sources

AGC	AGECON records created by Agriculture Canada
AGE	AGECON records created by the American Agricultural Economics Documentation Center
FNC	Food and Nutrition Information Center records
TRN	Records for materials in the NAL translation collection

SOURCE REFERENCE

SO

The source reference field in AGRICOLA records contains the bibliographic date needed to identify the item. Typically, for articles this field contains the journal name with volume, issue and page citations, or for monographic or serial cataloging records, this field contains imprint information. Indexers at NAL also use this field to note English summaries accompanying foreign language items and to call attention to items with substantial lists of bibliographic references. The information in this field cannot be searched though, of course, it will be printed out in a display of records.

TITLE

TI

Each item in the AGRICOLA database will contain an English title, all significant words of which may be used in the search mode. Naturally occurring punctuation within titles, as in abstracts, has been retained by the BRS system and must be accounted for in search strategies. For example, a searcher who simply uses FOOD ADJ POISON\$ to identify items on food poisoning runs the risk of missing items in which the terms may be hyphenated.

FOREIGN TITLE

TR

Although the original title for foreign language items (in Roman alphabets) is part of AGRICOLA records, the elements in this field cannot be searched. They will, however, be printed out as part of a display of full records.

YEAR OF PUBLICATION

YR

Through use of the LIMIT command, a searcher can quickly narrow his search to items published during a specific year or range of years. Each of the LIMIT options can be employed with this field; these options were explained in the previous section on the use of the LIMIT command.

NOTES

NOTES

APPENDIX A

RECOMMENDED READINGS

GENERAL

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APPENDIX B

ORBIT/DIALOG/BRS Basic Function Summary

FUNCTION	ORBIT	EXAMPLE	DIALOG	EXAMPLE	BRIS	EXAMPLE
Starting a search	Connected to ORBIT database at login or can use RESTART	RESTART	Connected to default ! file at !B logon or !10 can use BEGIN	BEGIN !B !10	System asks for name of database after sign-on	
Choosing a search file	FILE____ (file name)	FILE AGRICOLA	.FILE____ (file #) BEGIN (file #)	.FILE10 BEGIN10 !10	..CHANGE/____ (file name)	..CHANGE/CAIN
Entering search terms	Enter terms singly or with logical operators	ALFALFA PEAS AND TASTE	SELECT____ (term or reference numbers from an EXPAND	SELECT PEA S CC=4055 S LIVE(W) #AU=JONES, B F #E7-E8,E10	Enter terms singly or with logical operators	ALFALFA LIVE ADJ OAK JONES ADJ B ADJ F (4055 OR 4050).CC. AND MOISTURE
	FIND____ (desired terms)	FIND OAK FD CORN AND FUTURES				
Viewing list of index terms	NEIGHBOR____ (desired term)	NEIGHBOR OAK NBR NIX/AU	EXPAND____ (desired term)	EXPAND ROSE E AU=JONES "NO=HD9501	ROOT____ (desired term)	ROOT BEET ROOT HD9501 ROOT JONES
Coordinate search terms	Use logical operators when entering search or use to join search statement numbers	APPLE OR APPLES 4 AND ROT	COMBINE____ (set #'s joined by logical operators)	COMBINE 1*2 C3NOT4 C1-8/OR	Use logical operators when entering search or use to join search statement numbers	PIG AND 3010.CC. 1 AND (OAK OR ELM) 5 NOT (3 OR 4)
Reviewing search history	HISTORY	HISTORY HISTORY 7	DISPLAY SETS	DS 1-3 DISPLAY SETS @7	..DISPLAY	..DISPLAY ..DISPLAY 1,3 ..DISPLAY ALL
Viewing search results online	PRINT____ (format name or print elements & # of documents)	PRINT PRT TRIAL PRT FULL 10 PRT 5 AU,TI	TYPE / / _ DISPLAY _ / / _ (set# / format# / item# or # range)	TYPE6/2/1-9 T3/6/1-10 '10/5/1-5	..PRINT____ (set #, print elements, & document numbers)	..PRINT 3 ALL / DOC=ALL ..PRINT 5 TI/DOC=1
Ordering offline printing	PRINT OFFLINE (format & add'l specs.)	PRT FULL OFFLINE PRT 50 AU,TI,SO OFFLINE	PRINT _ / _ / _ (same data as in TYPE)&8/5/1-9	PRINT8/5/1-9 PR8/5/1-9 &8/5/1-9	..PRINTOFF (print elements, document #'s & ID tag)	..PRINTOFF P(ALL) DOC(ALL) ID(NIX)

APPENDIX C

ORBIT/DIALOG/BRS Retrieval Code Summary

ORBIT		DIALOG		BRS	
/AB*	Abstract	/AB	Abstract, full text	.AB.	Abstract
/AN	Accession number	RN=	Identification number	AN+	Accession number
/AU	Personal author	AU=	Personal author	.AU.	Authors, personal & corporate
/BI	Basic index: includes /TI and /IT	No qualifier: includes /TI, /AB,/CS,/DE	No qualifier: includes .TI., .AB., .AU., .CN., .IN., .CC.		
/CN	Call number	NO=	Call number	.CN.	Call number (no punctuation)
/DT	Document type: article, monograph, serial	DT=	Document type: monograph, review, series, bib,	PT*	Publication type: article (J) monograph (M), series (S)
/FR	Foreign language	Limit /MAJ for English and /MIN for foreign	Limit LG=EN for English and LG NE EN for foreign		
/FS	File segment: FNC, AGE, AGC	LO=	Location: FNC, AGE, AGC, RAR, REF, etc.	SN*	Source name: AGC, AGE, FNC
Institutional affiliation in /OS field		Institutional affiliation in /CS field		.IN.	Institutional affiliation
/IT	Controlled index terms	/DE	Descriptors, full text	.DE.	Descriptors
/LA	Language of publication	LA=	Language of publication	LG*	Language of publication
/NO*	Notes	Print only, not searchable	NT+	Notes	
/OS	Organizational source (1st 36 characters)	/CS	Corporate source	.AU.	Authors, personal & corporate
/PCC	Primary category code (6-digits throughout)	CC=	Category codes (4-digit)	.CC.	Category codes (4-digit & 2-digit)
/PD	Publication date; rangeable; add month if desired,e.g. 1975 FEB	OC=	Old codes (2-digit)	YR*	Publication year; searchable by year only
		SY=	Search year,e.g. 1975		
		SM=	Search month,e.g. 197502		
/SCC	Secondary category code	SD=	Search date,e.g. 19750215	.CC.	See category codes above
		CC= and OC=			
/SE*	Series statement	Print only, not searchable		Not part of BRS record	
/SN	Source name: USDA, AG EXP, AG EXT, FAO, TRANS	SC=	Source code; USDA, EXP STN, EXT, FAO, OTHER US	SN*	Source name: USD, EXP, EXT, FAO, TRN, 666 (for other US
Journal title abbreviation file not in ORBIT; search with STRS in /SO		JN=	Journal name or abbreviation	Journal title abbreviation file not in BRS; displayed as part of SO field	
/TR*	Translation	Included in DT=TRANSL		Included in SN=TRN	
/UP	Update to database, e.g. 7607/UP	UD=	Update to database, e.g. UD=7607; latest update: UD=9999	Individual tape updates not searchable online	
/TI*	Title; in /BI	/TI	Title	.TI.	Title

* Searchable by STRS or SENS only

* Limit only
+ Display only

APPENDIX D

CATEGORY CODES

CATEGORY CODE (CC=). Each document in the AGRICOLA database is assigned a numerical category code, representing a classification of the main subject or purpose of the article. For journal articles, this code also determines the placement of the record in the printed *Bibliography of Agriculture*. By choosing a general category code, e.g., 2010 for dairy products, the searcher eliminates the need to enter a large number of specific terms, thereby avoiding some of the inherent difficulties in searching the relatively uncontrolled vocabulary in AGRICOLA.

The Category Code includes the codes assigned to all documents since the beginning of 1972. (See the next section on Old Category Codes for those in use during 1970-71.) Generally, the most specific category available is assigned with the following subjects taking precedence: 1) insect vectors, 2) diseases, 3) pesticides. Double categories are rarely assigned.

Current category codes are four-digit numbers, e.g., CC=3505. The NAL Indexing and Cataloging Sections are the category codes listed below. FNC uses some of these categories, but has added others which specifically reflect the contents of the FNC subfile. The American Agricultural Economics Documentation Center has been using some categories which specifically reflect the contents of the AGE subfile, as listed on page 10-12. Beginning with March 1977, AGE documents are being assigned any appropriate NAL category code.

In the following example, the searcher wants information on the effects of pesticides on honeybees. Various names for honeybees are COMBINED with the category code for pesticides.

```
? SELECT HONEY(W)BEES; SELECT HONEY(W)BEE; SELECT HONEYBEE?; SELECT APIS
    24      590 HONEY(W)BEES
    25      482 HONEY(W)BEE
    26     1275 HONEYBEE?
    27     2157 APIS
? COMBINE 24--27/OR
    28     3563 24--27/OR
? SELECT CC=4560
    29     8510 CC=4560
? COMBINE 28 AND 29
    30      99    28 AND 29
```

A. NAL Category Codes (1972-)

General Agriculture and Rural Sociology

0505 General Agriculture and Rural Sociology

Agricultural Economics

- 1005 General Agricultural Economics and Land Economics
- 1010 Agricultural Administration and Management
- 1015 Agricultural Production Costs and Returns
- 1020 Agricultural Production Distribution (Farm Products)
- 1025 Statistical Data and Methodology
- 1030 Outlook, Policies, Programs and Legislation

Consumer Protection and Nutrition

- 1505 Consumer Protection
 - 1510 Human Nutrition
 - 1515 Home Economics
- (See also FNC categories)

Agricultural Products

- 2005 Agricultural Products, General
- 2010 Dairy Products
- 2015 Livestock Products
- 2020 Poultry Products
- 2025 Field Crop Products
- 2030 Horticultural Products
- 2035 Feed Products

Animal Science

- 2505 General and Miscellaneous Animal Husbandry
- 2510 Livestock Biology
- 2515 Livestock Feeding
- 2520 Livestock Breeding

Veterinary Medicine

- 3005 Veterinary Medicine
- 3010 Infectious and Parasitic Diseases
- 3015 Non-Infectious Diseases
- 3020 Miscellaneous Diseases and Injuries

Forestry

- 3505 Forestry, General
- 3510 Forest Economics and Management
- 3515 Silviculture
- 3520 Forest Industries

Plant Science

- 4005 General Plant Science
- 4010 Plant Taxonomy and Geography
- 4015 Plant Ecology
- 4020 Plant Morphology, Anatomy and Cytology
- 4025 Plant Genetics and Breeding
- 4030 Plant Physiology and Biochemistry, General

- 4035 Physiology and Biochemistry of Field Crops
- 4040 Physiology and Biochemistry of Horticultural Crops
- 4045 Physiology and Biochemistry of Forest Trees
- 4050 Field Crops, Culture
- 4055 Horticultural Crops, Culture
- 4060 Miscellaneous Economic Plants, Culture

Plant Diseases, Insect Pests and Control

- 4505 Plant Fungus Diseases and Control
- 4510 Plant Bacterial Diseases and Control
- 4515 Plant Virus Diseases and Control
- 4520 Miscellaneous Plant Diseases, Injuries and Control
- 4525 Weeds and Weed Control
- 4530 Insect Pests and Control, General and Miscellaneous Plants
- 4535 Insect Pests and Control, Field Crops
- 4540 Insect Pests and Control, Horticultural Crops
- 4545 Insect Pests and Control, Forest Trees and Wood Products
- 4550 Insect Pests and Control, Products
- 4555 Insect Pests and Control, Animals and Man
- 4560 Pesticides, General

Entomology

- 5005 General Entomology
- 5010 Taxonomic Entomology
- 5015 Apiculture and Sericulture

Agricultural Engineering

- 5505 Agricultural Engineering and Farm Structures
- 5510 Farm Equipment

Soil and Water Resource Management

- 6005 Soil Science
- 6010 Soil Improvement Materials
- 6015 Soil Resources and Management
- 6020 Water Resources and Management

General Natural Resources and Environmental Pollution

- 6505 General Natural Resources and Environmental Pollution

Auxiliary Categories

- 7005 Life Sciences
- 7505 Physical Sciences and Mathematics
- 8005 Chemistry
- 8505 Technology
- 9005 Economics and Administration
- 9505 Social Sciences and Humanities
- 9705 Information Science

B. FNIC Category Codes

- 1505 Consumer Education
- 1510 Nutritional Science and Nutrition Education
- 1520 History
- 1525 Food Standards and Legislation
- 1530 Management and Administration
- 1535 Education and Training
- 1540 Menu Planning
- 1545 Food Preparation and Production
- 1550 Equipment
- 1555 Sanitation and Safety
- 1560 Food Technology
- 1565 Programs--General
- 1570 Recipes
- 1575 Reference Materials
- 1580 Purchasing, Receiving and Storage

C. AGECON Category Codes (1970-1976)

- 1010 Agricultural Marketing
- 1020 Agricultural Policies and Programs
- 1030 Agricultural Products Demand, Supply, and Processing
- 1040 Food and Consumer Economics
- 1050 Foreign and International Development
- 1060 Production Economics and Farm Management
- 1070 Regional and Human Development
- 1080 Resource Economics
- 1090 General (not elsewhere classified)

OLD CATEGORY CODES (OC=). The two--digit category codes assigned to documents entered in AGRICOLA during 1970-71 are included in this field. A listing of the old categories follows.

For comprehensive searching using category codes, both old and current codes should be included in the strategy.

1970-1971 Category Codes

- 05 Agriculture (general)
- 10 Agricultural economics and rural sociology
- 15 Agricultural products (economics and technology)
- 20 Animal sciences
- 25 Chemistry
- 30 Engineering
- 35 Entomology
- 40 Food, human nutrition, and home economics

45	Forestry
50	Life sciences (general)
55	Natural resources (general)
60	Pesticides (general)
65	Physical sciences (general)
70	Plant science
75	Social science (general)
80	Soils and fertilizers
85	Water resources
90	Reference materials

APPENDIX E

Agricultural Saved Searches on DIALOG

A saved search is a permanently stored set of a large number of terms, frequently complex, which are used many times in searching. Five agricultural subject and seven geographic saved searches have been created by the Reference Branch, Technical Information Systems in order to save staff time on recurring sets or topics. These saved searches are stored on the DIALOG system.

Both subject and geographic saved searches may be recalled by code and executed in combination with other search terms, category codes, or with other saved searches. For example, a total search result can be obtained by recalling and executing the saved search on South America, then recalling the saved search on plant varieties and combining the two with the logical "and." The result is a list of bibliographic citations on plant varieties in South America. The more than fifty terms involved are automatically pulled from storage in a fraction of the time it would take to input all of them individually. The savings are real if the stored sets are limited to often used combinations and complex groupings.

A drawback in geographic searches of agricultural or biologic databases are the false drops, e.g., a search on Guinea as an African country also provides material on New Guinea, guinea pigs, guinea fowl, guinea corn, etc. Such terms are excluded through use of the "not" command. These problems have been overcome within each stored search.

Lockheed Information Systems recently made available a technique for executing any known saved search regardless of source so long as the requester knows the user number and serial number of that source. The command structure for the search on Africa is: Execute 11YY/USER9018. The results are posted to cover the entire database as of the date on which the search was executed as:

Set No.	No. of hits
1	- - - - -

The user would then proceed to select terms against which to match, such as:

s corn; s maize; s zea(w)mays; c1 and (2, 3 or 4).

These saved searches have been created by Technical Information Systems:

SUBJECT

- cell tissue culture
- genetic material
- no tillage, minimal tillage and companion crops
- pest management
- plant varieties

GEOGRAPHIC

- Africa
- Asia and the Middle East
- Central America and the Caribbean
- South America
- United States

On the pages following, the details of the search and its coverage as well as the Execute codes are given. Any subscriber to the DIALOG system may use these stored searches.

Any portion or subset of any saved search in DIALOG may be selected or recombined by making the execute command as follows:

Execute steps SSN/USRR - - -

CELL TISSUE CULTURE

(SAVED SEARCH S3/USER 9018)

S ANTHER
S ANTHERS
S ASEXUAL
S CALLUS
S CELL
S CELLS
S CULTIVATED
S CULTIVATION
S CULTURE
S CULTURED
S CULTURES
S CULTURING
S EMBRYONIC
S FUSION
S HAPLOID
S HAPLOIDS
S HYBRID
S HYBRIDS
S HYBRIDIZATION
S INDUCTION
S ISOLATED
S ISOLATION
ENTER--
S LINES
S MERISTEM
S MERISTEMATIC
S PARASEXUAL
S POLLEN
S PROTOPLAST
S PROTOPLASTS
S SHOOT
S SOMATIC
S SUSPENSION
S SUSPENSIONS
S TEST(W)TUBE
S TISSUE
S TISSUES
S VITRO
S INVITRO
C7-12/+
C1-6/+
C25-39/+
C40*(41+15+16+42)
C4*(1+2+5+6+25+26+31+29+30+35+36+37+38+39)
C
C28*(29+30+4)
C(35+38+39)*(5+6+13+1+2+15+16+36+37+25+26+31)
C(1+2)*(36+37)
C(5+6)*(21+22+23+24+25+26+31+33+34)
C(29+30)*(14+15+16+21+22)
C(3+27+32)*(17+18+19)
C43--51/+

COMMAND: .EXECUTE S3/USER9018

GENETIC MATERIAL

(SAVED SEARCH G3/USER 9018)

S IDIOGRAM
S IDIOGRAMS
S KARYOECOLOGY
S KARYOGENETICS
S KARYOGRAM
S KARYOLOGIC
S KARYOLOGICAL
S KARYOLOGY
S HETEROCHROMATIC
S HETEROCHROMATIN
S EUCHROMATIC
S EUCHROMATIN
S CHROMATID
S CHROMATIDS
S CHROMOSOMAL
S CHROMOSOME
S CHROMOSOMES
C1-17/+

COMMAND: .EXECUTE G3/USER9018

NO TILLAGE, MINIMAL TILLAGE AND COMPANION CROPS

(SAVED SEARCH 5IB/USER 9018)

S INTERCROP
S INTERCROPPED
S INTERCROPS
S INTERCROPPING
S INTERSEED
S INTERSEEDED
S INTERSEEDING
S INTER(W)SEED
S INTER(W)SEEDED
S INTER(W)SEEDING
S INTER(W)PLANT
S INTER(W)PLANTED
S INTERPLANTING
S INTERPLANTED
S CROP
S CROPS
S CROPPING
S INTER
S COMPANION
S COMPANIONATE
S COMBINATION
S MULTIPLE
S DOUBLE
C16-18/+
C19-24/+
C25*26
S TILL
S TILLING
S TILLAGE
S TILLED
S ZERO
S MINIMUM
S REDUCED
S LOW
S REDUCING
C28-31/+
C32-36/+
C37*38
S NO(W)TILL
S NO(W)TILLAGE
S NON(W)TILL
S NON(W)TILLAGE
S NO(W)TILLING
C40-44/+
C1-15/+
C27+39+45+46

COMMAND: .EXECUTE 5IB/USER9018

PEST MANAGEMENT

(SAVED SEARCH NB/USER 9018)

S ALTERNATIVE
S BENEFICIAL
S BIOLOGICAL
S CULTURAL
S ECOLOGICAL
S ECOSYSTEM
S ENVIRONMENTAL
S INTEGRATED
S MANAGEMENT
S NATURAL
S NONCHEMICAL
S NON(W)CHEMICAL
S RESISTANCE
S RESISTANT
S SUPPRESSION
S SUPPRESSIVE
C1-16/+

COMMAND: .EXECUTE NB/USER9018

PLANT VARIETIES

(SAVED SEARCH XDO/USER 1987)

S VARIETAL/TI,DE
S VARIETIES/TI,DE
S VARIETY/TI,DE
S VARIATION/TI,DE
S VARIATIONS/TI,DE
S CULTIVAR/TI,DE
S CULTIVARS/TI,DE
S BREEDING/TI,DE
S SELECTION/TI,DE
S SELECTIONS/TI,DE
S GENETIC/TI,DE
S GENETICS/TI,DE
S INHERITANCE/TI,DE
S TRIALS/TI,DE
S STRAIN/TI,DE
S STRAINS/TI,DE
S FORM/TI,DE
S FORMS/TI,DE
S TEST/TI,DE
S TESTS/TI,DE
S TESTING/TI,DE
S LINE/TI,DE
S LINES/TI,DE
S TYPE/TI,DE
S TYPES/TI,DE
S PERFORMANCE/TI,DE
S PERFORMANCES/TI,DE
S CHARACTER/TI,DE
S CHARACTERS/TI,DE
S CHARACTERISTIC/TI,DE
S CHARACTERISTICS/TI,DE
S IMPROVED/TI,DE
S IMPROVING/TI,DE
S IMPROVEMENT/TI,DE
S IMPROVEMENTS/TI,DE
S IMPROVE/TI,DE
S IMPROVES/TI,DE
S RESISTANCE/TI,DE
S RESISTANT/TI,DE
C1-14/+
C15-28/+
C29-41/+

COMMAND: .EXECUTE XDO/USER1987

AFRICA

(SAVED SEARCH Y9G/USER 9018)

S AFRICA?
S ALGERI?
S ANGOLA?
S BENIN?
S BOTSWAN?
S BURUND?
S BECHUANA?
S CAMEROON?
S CAMEROUN?
S CAPE(W)VERDE
S CHAD?
S CONGO?
S DAHOMEY?
S EGYPT?
S ERITREA?
S ETHIOPIA?
S GABON?
S GAMBIA?
S GHANA?
S IVORY(W)COAST
S KENYA?
S LIBERIA?
S MALI?
S MALAWA?
S MADAGASCA?
S MALAGASY?
S MOCAMBIQ?
S MOZAMBIQ?
S MOROCC?
S MAURIT?
S NAMIB?
S NIGER?
S NYASA?
S RHODESI?
S RWAND?
S SAHEL?
S SAHARA?
S SENEGAL?
S SIERRA(W)LEONE
S SOMALI?
S SUDAN?
S SWAZILAND?
S TANGANYIK?
S TANZANIA?
S TCHAD?
S TOGO?
S TUNIS?
S UARS
S UNITED(W)ARAB
S VOLTA?
S ZAIRE?

S ZAMBIA?
S GUINEA
S GUINEAN
S ASPERGILLUS(W)NIGER
S SUDAN(W)GRASS
S SUDANGRASS
S NEW(W)GUINEA
S GUINEA(W)FOWL
S GUINEAPIG?
S GUINEA(W)PIG
S GUINEA(W)PIGS
S GUINEA(W)GRASS
S GUINEA(W)HEN
S GUINEA(W)HENS
S GUINEA(W)CORN
S GUINEA(W)WORM
S GUINEA(W)WORMS
C 55--68/or
C 1--14/or
C 15--28/or
C 29--42/or
C 43--54/or
C (70 or 71 or 72 or 73)--69

COMMAND: .EXECUTE Y9G/USER9018

ASIA AND MIDDLE EAST

(SAVED SEARCH QE5/USER 9018)

S CHINA?
S CHINESE
S INDIA?
S BANGLADESH?
S PAKISTAN?
S VIETNAM?
S VIET(W)NAM
S PHILIPPIN?
S THAI?
S KOREA?
S IRAN?
S BURM?
S AFGHANI?
S TAIWAN?
S FORMOSA?
S SRI(W)LANKA
S CEYLON?
S NEPAL?
S MALAYSIA?
S MALAY?
S IRAQ?
S SAUDI?
S ARABIA?
S CAMBODIA?
S SYRIA
S HONG(W)KONG
S LAO
S YEMEN?
S LEBAN?
S JORDAN?
S SINGAPORE?
S MONGOL?
S MANCHURIA?
S ISRAEL?
S PALESTIN?
S BHUTAN?
S OMAN?
S MACAO?
S BAHRAIN?
S MALDIVE
C 1-15/or
C 16-30/or
C 31-43/or
S INDIANA
C 43-44

COMMAND: .EXECUTE QE5/USER9018

CENTRAL AMERICA AND THE CARIBBEAN

(SAVED SEARCH 11YY/USER 1299)

S MEXIC?

C 15-28/or

S CUBA?

C 29-40/or

S GUATEMAL?

C 41-44/or

S DOMINICA?

C 45 or 46 or 47) -48

S HONDURA?

S HAITI?

COMMAND: .EXECUTE 11YY/USER 1299

S CURACAO?

OR .EXECUTE STEPS 11YY/USER 1299

S ARUBA?

S PUERTO(W)RICO

S PUERTO(W)RICAN

S NICARAGUA?

S JAMAICA?

S COSTA(W)RICA

S COSTA(W)RICAN

S PANAMA?

S CANAL(W)ZONE

S MARTINIQUE?

S GUADELOUP?

S BARBAD?

S TRINIDAD?

S TOBAGO?

S ANTILLE?

S BAHAMA?

S SALVADOR?

S ST(W)LUCIA

S GRENADA?

S ST(W)VINCENT

S ST(W)KITTS

S BERMUDA?

S BELIZE?

S ANTIGUA?

S BONAIRE?

S NEVIS

S CENTRAL(W)AMERICA

S CENTRAL(W)AMERICAN

S CARIBBEAN

S WEST(W)INDIES

S WEST(W)INDIAN

S LATIN(W)AMERICA

S LATIN(W)AMERICAN

S NEW(W)MEXICO

S NEW(W)MEXICAN

S BERMUDAGRASS?

S BERMUDA(W)GRASS

S BERMUDA(W)GRASSES

S BERMUDA(W)ONION

S BERMUDA(W)ONIONS

C 1-14/or

(SAVED SEARCH 1I YV/USER 1299)

The above search may be executed by anyone using the following :

```
.EXECUTE 1IYV/USER1299          or by
.EXECUTE STEPS 1IYV/USER1299
```

UNITED STATES

(SAVED SEARCH 1IY2/USER 1986)

S ALABAMA?
S ALASKA?
S ARIZON
S ARKANSAS?
S CALIFORNIA?
S CAROLINA
S COLORADO?
S CONNECTICUT?
S CONNECTICUT?
S DAKOTA?
S DELAWARE?
S FLORIDA?
S GEORGIA?
S HAWAII?
S IDAHO?
S ILLINOIS?
S INDIANA?
S IOWA?
S KANSAS?
S KENTUCKY?
S LOUISIANA?
S MAINE?
S MARYLAND?
S MASSACHUSETTS?
S MICHIGAN?
S MINNESOTA?
S MISSISSIPPI?
S MISSOURI?
S MONTANA?
S NEW(W)HAMPSHIRE
S NEW(W)JERSEY
S NEW(W)MEXICO
S NEW(W)MEXICAN
S NEW(W)YORK
S NEBRASKA?
S NEVADA?
S OHIO?
S OKLAHOMA?
S OREGON?
S PENNSYLVANIA?
S RHODE(W)ISLAND
S TENNESSEE?
S TEXAS
S TEXAS?
S UTAH?
S VERMONT?
S VIRGINIA?
S WASHINGTON?
S WISCONSIN?
S WYOMING?
S DISTRICT(W1)COLUMBIA
S U(W)S

S USA
S UNITED(W)STATES
S NEW(W)ENGLAND
S MIDDLE(W)ATLANTIC
S APPALACHI?
S GREAT(W)BASIN
S GREAT(W)LAKES
S GREAT(W)PLAINS
S ROCKY(W)MOUNTAIN
S ROCKY(W)MOUNTAINS
S MIDWEST?
S MIDSOUTH?
S NORTH?
S EAST?
S SOUTH?
S WEST?
S STATES
C69*(65+66+67+68)
C1-16/+
C17-32/+
C33-48/+
C49-64/+
C70-74/+

COMMAND: .EXECUTE 1IY2/USER1986

NOTES
